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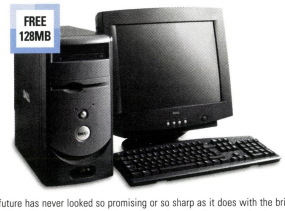
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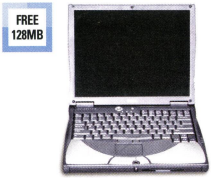
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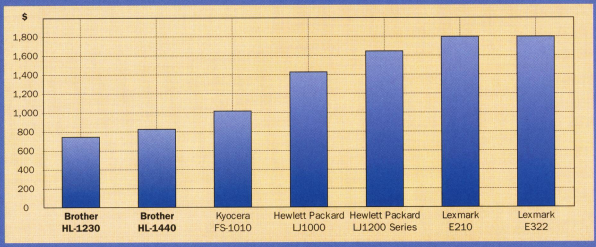
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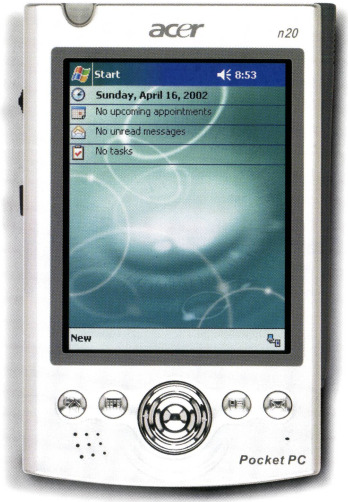


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Penguin sunny-side up ▶

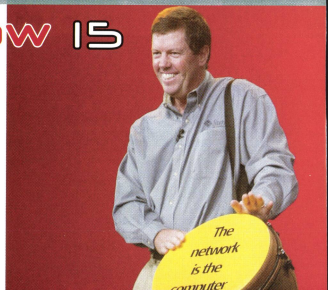
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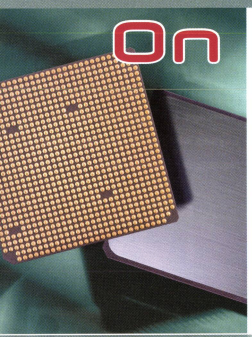
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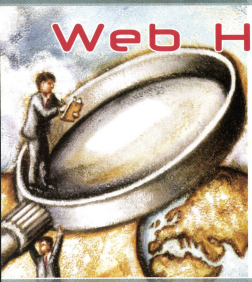
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- Fuji Xerox Phaser 8200DX
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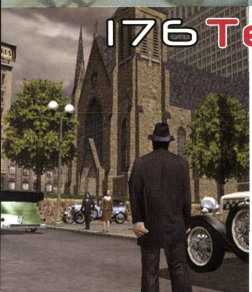
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Workshop

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Networking: Windows XP and 9x
Linux: up and running with Mandrake 9
Windows: make the most of idle PC power
SWiSH: fast and cheap Flash text animation
CSS: streamline and style-up your Web site
Perl: transform your Web site's interactivity
Photoshop: creating tabbed Web interfaces
Pocket PC: skinning your handheld

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GAMES:
- **Mafia (PC)**
- **Sum of all Fears (PC)**
- **Emperor: Rise of the Middle Kingdom (PC)** ... and more

DVDS:
- **Spy Game** ... and more

BOOKS:
- **How To Do Everything With Windows XP** ... and more



APC's privacy statement appears on page 184.

CD Contents



When you see this CD icon in APC, it means there's bonus software on the cover CD set.

SWiSH 1.52 — full version!

Create impressive Flash text animations for the Web with SWiSH 1.52, free on this month's CD. Plus, use the bonus offer on the CD to receive a 10% discount to upgrade to SWiSH 2!

Netscape 7

With a friendly interface and greater stability than its predecessor, Netscape 7 brings fresh hope to anyone who misses the days when Netscape ruled the Web.



Benchmark your PC!

Just how much grunt does your PC really have? Find out with our full suite of benchmarking tools. They're also great for checking what performance boost you get out of any system upgrades.

Unreal Tournament 2003

While many FPS titles are walking backwards and recreating famous conflicts of the past, Unreal Tournament 2003 holds up the flag for future deathmatching that's both fast and furious.



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POCKET PC Dashboard v1.1.001a, Pelmar WIS Bar 1.1.0, Pocket facelift 1.5, Skin Me for Dashboard v1.2.69, Theme Generator for Pocket PC 2002, Today's The Day v1.3, XPMA Grey Dashboard/WISBar skin
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Mandrake Linux 9.0

Mandrake Linux 9.0 is here, and it's exclusive to this month's *APC*!

We've got the final "gold code" (not a rough beta build) and fresh-baked it onto two CDs. Load the first CD, follow our *"Up and Running with Mandrake Linux 9"* Workshop on page 154, and you'll soon be enjoying this exciting new distro.

Mandrake 9.0 makes Linux easy for the newbie and smooth for the super-user, with features such as "supermount", which lets users access removable media such as CD-ROMs and floppy discs without using the traditional "mount/unmount" commands. Mandrake Linux 9.0's hardware recognition is impressive, as are the new security features.

Our two CD bonus set also boasts a collection of Linux favourites such as OpenOffice.org; and if you've been eager to try KDE 3, GNOME 2 or GCC 3, then wait no longer, because we've got them too!

Our Mandrake Linux 9.0 set includes:

- **New DrakConf**
- **Many new and improved configuration utilities**
- **XFree86 4.2.1**
- **KDE 3.0.2**
- **GNOME 2.0**
- **Mozilla 1.1**
- **Apache 1.3.26 and Apache 2.0.40**
- **Evolution 1.0.8**
- **Galeon 1.2.5**
- **OpenOffice.org 1.0.1**
- **KOffice 1.2**
- **Shorewall firewall utility**
- **GCC 3.2**

And lots more waiting to be discovered!



Installation

We've unpacked the first and second CD ISOs and burnt them for you. All you have to do is slip the bootable Mandrake CD1 into the CD-ROM drive and restart your computer. For a slightly more detailed installation guide, turn to page 154.

Technical support

***APC* cannot provide technical support for Mandrake Linux 9.0 installation. *APC* will, however, replace any faulty CDs. There are a number of third parties that offer installation support from Mandrake Linux 9.0. Please see *"Up and running with Mandrake Linux 9"* (page 154) for a list of help resources.**

Source code

If you would like a copy of the Mandrake Linux 9.0 source code on CD, please send a cheque or money order made out to ACP Direct for $10 to the address below. This covers the cost of postage and production. Alternatively, you can download the source code through *www.mandrakelinux.com*.

APC
Mandrake source code
PO Box 4088
Sydney NSW 1028

Need help?

> While we've taken all care in selecting the software and testing the discs, *APC* cannot accept responsibility or liability.
> *APC* does not provide support for programs included on the discs.
> For technical problems with the disc itself:
Email: cd@apcmag.com
Web : www.apcmag.com/cd
Phone: (02) 9288 9111

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AUSTRALIAN PERSONAL COMPUTER
YOUR TOTAL TECHNOLOGY GUIDE

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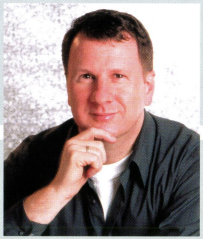
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ISSUE 287 NOVEMBER 2002



It's late at night and the *APC* team has just completed this 208-page issue, centred around a megatest of 56 desktop PCs.

Why 56, you may ask? Because that's as many PCs as we could get our paws on! We could have settled for a dozen P4- and Athlon-powered "El Grunto" machines. Or even two dozen systems in the $1,500-$3,500 "sweet spot".

But *APC* readers find themselves in a unique position. We're not just shopping for ourselves. We're also called upon by friends, family and workmates to act as their tech advisors — to recommend which PC they should buy for themselves, for their kids going to uni, or for their community group managing on a shoestring budget.

That's why our megatest spans from sub-$1,500 budget beaters to dream machines that zoom past the $5,000 mark without even stopping for a smoko. And we're all pretty stoked by how much PC you can buy for your money these days.

Even some of the $1,499 boxes astounded us with their "bang per buck" factor, especially those fitted with AMD's XP1800 and XP2000 powerplants.

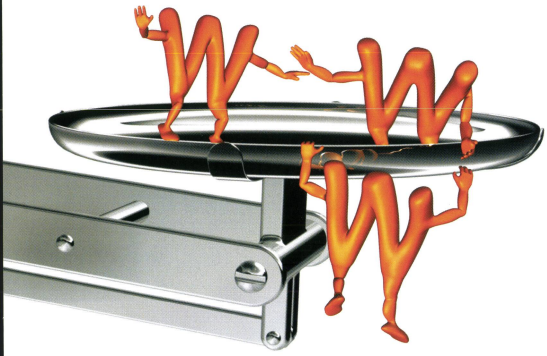
Most of our 56 contenders had at least 256MB of memory, plenty had 512MB or more. Graphics? No sweat. Many vendors opted for nVidia's mighty TI4600 card, and even in the lower end machines, the nimble TI4200.

So when all the PCs' specs are strong, is it hard to go wrong? Not at all. Overall performance and build quality were two areas where we saw some appalling results. And that's why *APC* is here — because, like you, we go beyond the spec sheets.

David Flynn

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Telstra



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Standard dial-up Internet

- Great for email and web browsing.
- Dial-up the Internet using your existing phone line.

What could you be paying now?

Example of possible monthly charges for customers with two standard telephone lines, one of which is dedicated to dial-up Internet use.

Dial-up Internet monthly plan fee	$25.00
Additional monthly residential phone line rental	$20.00
Dial-up monthly costs^	$6.60
Total monthly cost	**$51.60**

High-speed broadband Internet

- Download large files and images in just seconds.
- No dial-up costs, frees up your phone line, and no need for a second line#.

Is this better value?

Example of monthly charge once connected to Telstra BigPond broadband cable 300MB plan.

Monthly access fee, once connected	$54.95~
Additional monthly phone line rental	N/A
Dial-up monthly costs	N/A
Total monthly cost for usage <300 MB	**$54.95~**

Visit www.bigpond.com/broadband or call 1800 645 777 for your superfast broadband Internet experience.

The example used is for illustrative purposes only and charges can vary depending on the amount/number of dial-up costs, phone line connected and dial up Internet service chosen. *Discounts available to most customers who are directly billed by Telstra for line rental and local calls and preselected to Telstra for long distance calls with their eligible fixed line. Call 1800 645 777 for more details. ^Calculations based on 30 connections per month @22cents per connection. #Excludes Telstra BigPond One Way Satellite which requires a dial up connection for the return path. ~Minimum package cost for 12 months continuous access and connection to Telstra BigPond broadband Cable 300mb plan is $918.40 (includes $259 installation charge and modem) and 18 months is $1,178.10 (includes $189 installation charge and modem). Additional usage above 300mb charged at 15.9 cents per MB. Cable is not available all areas. Visit www.bigpond.com/broadband for further information. ™Trade mark at Telstra Corporation limited ABN 33 051 775 556. TCM1180_VAL_MET_APC

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With new PartitionMagic® 8.0

It's a well-known fact that the best way to keep some things safe is to keep them separate. It's the same with your PC.

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POWERQUEST

need to know

News, views and analysis from the IT world

Sun-Linux budget PC

Sun's partnering with Linux to sell cheap off-the-shelf PCs with a complete open source OS will give Microsoft's white box market real competition.

They call it a Purple Box — a Linux PC that costs half the price of a Windows white box. When Sun announced details of the plan at September's SunNetwork 2002 conference in San Francisco, they declared it "an alternative to purchasing expensive Microsoft software."

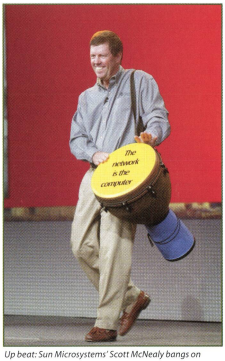
Sun's purple box will go head-to-head with the dominant Windows white box. A standard purple box will have a software bundle to rival Windows — including a Linux operating system; a GNOME user interface; OpenOffice for business; Mozilla for Web browsing; and an Outlook-compatible email client.

But it's not quite a full-scale Linux revolution. The purple boxes will be sold to enterprises in batches of 100, along with Sun's servers.

universities. Its also targeting government departments, call centres, banks, retailers or any workforce engaged in simple data entry, Internet access and office tasks. "We can dramatically reduce the cost per user, not only for acquisition but ongoing operation," Bennet said.

Already, Sun claims new and existing customers are showing interest in its Linux initiatives. Sun needs the fresh interest. Research from IDC shows Microsoft's market share of new server operating system licenses grew from 42% in 2000 to 49% in 2001. Market share for Linux remained steady at 25% over the same period.

HP, IBM and even Dell now offer inexpensive Intel-based servers, making Microsoft's .NET Server an attractive option for many enterprises.



Up beat: Sun Microsystems' Scott McNealy bangs on about the Sun-Linux PC, and finally delivers.

> "This is based on open source technology which gives the customer freedom from Microsoft's licensing fees"

Unlike some early attempts to introduce Linux to the masses, Sun claims its Linux interface will be as easy to use as Windows. "What will come out will be an all-inclusive, fully supported solution with a familiar look and feel and integrated applications based around open source technologies," said Sun's director of Linux products, Duncan Bennet. Also, unlike the majority of open source software, Sun will fully support and integrate the systems.

Sun wants to establish a toehold on the desktop at the expense of arch-nemesis Microsoft. "This is all based on open source technology which obviously, by definition, gives the customer freedom from Microsoft's licensing fees and renewal fees," Bennet explained.

A 100-strong purple box network will cost around US$296,000 over a five-year period, according to Sun. They claim a similar white box setup would cost just over US$1 million.

Sun hopes the lure of spending less on Windows and more on hardware will prove irresistible for cost-conscious schools and

To compete, Sun wants to establish a strong, non-Microsoft platform for Intel-based servers and clients. It's made significant contributions to open source projects, including Mozilla, Linux and GNOME. But Sun's determination to unseat Microsoft by providing a complete hardware and software system brings a new set of risks for a company best known for high-end server hardware and software.

Each purple box will be connected to a Sun server (Sun launched its first x86-architecture entry-level Linux server in August) and users will be authenticated via Sun's Java Card technology. Yet this "thin-client" model, where users store and access everything on remote servers, hasn't undermined the entrenched affinity for stand-alone PCs, where information is stored on a local drive.

Hardware analysts such as Gartner's Ian Bertram are cautious over the plan. "Sun should carefully balance its desire to wrest Microsoft's control of the client platform against the risk of participating in the PC market."

The exact manufacturing strategy and hardware specs will emerge next year when Sun expects to ship the first purple boxes to customers. Prototypes are due at its iForce centre in Sydney by November. ETTP

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The US entertainment lobby just created a nightmare for Australian Net access.



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Dealing with troublesome traders on eBay can be hard enough without eBay itself playing hard to get.



24 Epinions
APC readers give their opinions on "switching", plus some handy tips.



'Confusing' budget Office XP trial canned

A cut-price Microsoft consumer subscription trial sounded great, until the reality of the offer hit home for users.

Microsoft has dumped a consumer subscription trial for Office XP after some customers thought it was a way to get Office on the cheap. The trial began in May 2001 and attracted 10,000 people across New Zealand, Australia and France. Trial participants paid around one-third of the retail price and were allowed to use Office for 12 months.

According to Microsoft, some people were attracted by the cheaper shelf-price, but didn't understand they had to keep paying to use the product. "They were interested in the product because it was a cheaper version, essentially," said Microsoft Australia Office product manager Tony Wilkinson. "What we found when we did some research was that a number of people had been attracted to that price point but hadn't actually understood what they'd bought." He said some people had found the subscription purchasing model confusing. "A large number of them didn't realise the product would actually expire in 12 months."

Microsoft announced they had shelved the trial in September and said participants would receive a free full version. "We still believe that the concept of software delivered as a service is absolutely the way things will trend over time," said Wilkinson.

But competitors are moving to capitalise on confusion over Microsoft's new business licensing. Major rivals Sun and Corel told *APC* they've experienced a recent surge in inquiries for their office software.

Microsoft isn't panicking yet. At last count, they had around 90% of the office software market. However, analysts Gartner estimate Sun's StarOffice could corner 10% of the market by 2004. Overseas, HP and Dell recently agreed to pre-load WordPerfect on some desktops in favour of Microsoft Works (Corel confirmed they're discussing similar deals in Australia).

What's different in today's market is that the alternatives have finally cracked a major pillar supporting Microsoft's dominance in office software — file compatibility.

OFFICE XP STANDARD

Vital stats:

Word	Spreadsheet	Presentation	Email	Database	Draw
✔	✔	✔	✔	✖	✖

Retail: $1,072

So absolute is Microsoft's power in office software that competitors need to be "Office-friendly". But Microsoft isn't rising to the bait. "Our real focus is about demonstrating the value of our product rather than necessarily trying to have a low-cost battle with competitors," Microsoft's Tony Wilkinson said. He points to the overall business productivity, and the overall data management and integration advantages of Office. "There's a return on investment that you've got to look at and it covers more than just the initial purchase price." (All prices are a guide only.)

Open License Program:

New Licence	$874
Software Assurance (2 years)	$506

COREL WORDPERFECT OFFICE 2002 STANDARD

Vital stats:

Word	Spreadsheet	Presentation	Email	Database	Draw
✔	✔	✔	✔	✖	✖

Retail: $908

The very worthy WordPerfect is attempting to entice entrenched Microsoft users with a special toolbar that mimics the look of Office. It also has a default save setting that automatically turns every file into an Office document. This is meant to help retrain Office users, said Corel Asia Pacific's Gavin Watson. "People are making decisions based first on price and then based on functionality and compatability." WordPerfect is used in government, corporate, educational, health, legal and police circles. Its major drawcards are macros, the ability to reveal code and publishing straight to PDF. Its drawback remains compatibility across older versions.

Volume:

1-10	$780
11-25	$745
26-60	$710
61-120	$677
121-250	$650

SUN STAROFFICE 6 OFFICE SUITE

Vital stats:

Word	Spreadsheet	Presentation	Email	Database	Draw
✔	✔	✔	✖	✔	✔

Retail: $209

StarOffice was a free download until last May. "We found that a number of a commercial customers weren't very happy with [the free] approach . . . They also questioned our longer term commitment," said Sun's Ken Cross. Sun has added a few features, set up a support program and started to charge for it. Since then, 180 large Australian organisations have requested evaluation copies. "It offers 80% of the capabilities [of Microsoft Office], the capabilities that most people use. It's a more cost-effective solution than paying a lot of money to Microsoft for features that you're not going to use."

Volume:

25	$160 per licence
150	$114
250	$109.20
500	$102.60
10,000	$56.94 (ex GST)

OPENOFFICE

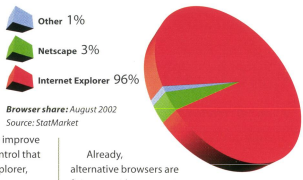
Vital stats:

Word	Spreadsheet	Presentation	Email	Database	Draw
✔	✔	✔	✖	✖	✔

Free at www.openoffice.org

If you're enraged by the price of software, go straight to the people who are giving it away. The open source community developed OpenOffice's base on Sun's StarOffice code. It's almost everything you need without the slick Office feel. It's very similar to StarOffice but unlikely to crack the business market without any (formal) support. OpenOffice is very similar to StarOffice, without the database program and some extra fonts. A legion of enthusiastic open source programmers are continuing to develop features and a Mac version is expected to appear soon.

Browser roulette



Browser share: *August 2002*
Source: StatMarket

Windows XP SP1 could put Netscape back in the browser race.

What makes Windows XP Service Pack 1 like no other Microsoft update is a new feature giving you ultimate control over default programs. It's all part of the requirements of a proposed antitrust settlement between Microsoft, nine US States and the Department of Justice. The new feature could reshape the entire browser, media player and email software industry — if enough people bother to use it.

SP1 (reviewed on page 38) went public in September. As well as hundreds of bug fixes already released through Windows Update (and other code changes designed to improve security), it includes a new default control that defines desktop access to Internet Explorer, Windows Media Player, Windows Messenger, Outlook Express and Microsoft's Java virtual machine. The feature lets PC makers choose the default programs on new machines or invite customers to select their preferred software when they first log on. Third party software makers will need to update their programs to take advantage of the feature (many are expected to support it in upcoming versions).

Already, alternative browsers are firing up with new versions. Netscape is looking to recover the 10% of users it has lost in the last 12 months, Mozilla is stable and compatible enough for mainstream audiences and Opera is currently completely overhauling its core. Web developers who only test in Internet Explorer are on notice: comply with standards laid down by the World Wide Web Consortium (W3C), or else.

INTERNET EXPLORER
Microsoft's browser is now virtually a Web standard. So widespread is it, that the latest version of Internet Explorer 6 has become the victim of security issues. As such,users need to keep an eye out for updates.

OPERA
Built for speed rather than features, Opera boldly claims to be the "fastest browser on earth". Its quick page loads, keyboard shortcuts, a newsreader and strict adherence to W3C standards have given Opera a die-hard following who are prepared to tolerate the occasional warped page-view you get when it tries to render non-standard dynamic Web content (or because some Web developers don't bother testing in Opera). Warning: the free version has ads.

NETSCAPE
It's a miracle Netscape has survived beyond the bloodbath that was version 6. The new Netscape 7 brings fresh hope to anyone who misses the days when Netscape ruled the Web. It's based on the same code as Mozilla, with a friendly look and set of features developed under the banner of AOL (it comes with AOL Instant Messenger but lacks Mozilla's much-loved pop-up killer).

MOZILLA
Netscape released its core code to the open source community in 1998 and four years later Mozilla was born. It's a full-featured browser to rival Internet Explorer, with a built-in pop-up killer and tabbed browsing. Version 1.1 has proven to be stable, fast and compatible.

We're not infected, pleads antivirus vendor

Finding nasty viruses hidden in emails isn't anything out of the ordinary, except when the emails come from your antivirus company.

A particularly nasty strain of a major virus has been raising eyebrows across the Net by arriving via email addressed from antivirus software companies. The bogus messages sometimes masquerade as virus warnings seemingly sent by Sophos, Trend Micro, Symantec or other vendors.

Sophos was not amused, releasing a hasty "not guilty" statement reassuring its customers that "we have not been infected or sent any viruses".

Fortunately, there hadn't been any monumental disaster involving antivirus labs accidentally spilling their quarantined nasties onto the Net. Rather, it was another case of Klez, the heir apparent to last year's most reported and notorious virus, Code Red. A strain of Klez (W32/Klez-H) leads this year's Virus "Top Ten", accounting for almost 30% of viruses reported to Sophos in the first six months.

The virus is classified as a "blended threat", a new buzzword in security circles used to describe the multi-pronged attacks of viruses like Code Red, Klez and Nimda. These not only spread via email address books, but can target companies in network-style attacks, or even attempt to disable antivirus software and delete files. Symantec is now telling corporates not to rely on antivirus software alone for protection.

Major antivirus software packages can be updated to scan for Klez and Code Red. A patch can also be downloaded from Microsoft that fixes a vulnerability exploited by Klez in some versions of Outlook, Outlook Express and Internet Explorer. Visit **www.microsoft.com/technet/security/bulletin/MS01-027.asp**.

Clever Klez

How Klez worms its way inside your PC

- Using its own SMTP engine, it can appear to come from any email address.
- Tricks users with greetings or messages, each automatically picked from a list. For example, the Garden of Eden, Sos!, spice girls' vocal concert, Japanese lass sexy pictures.
- Tries to run automatically without user double-clicking on attachment.
- Drops virus into the Program Files directory and executes.
- Tries to disable antivirus software and delete related files.
- W32/Klez-H copies itself into the Windows system directory as random EXE file.
- Searches for email addresses in Windows address book and also in documents such as PDF, TXT, DOC, HML files. Uses these (or hoax antivirus vendor address) to spread.
- May attach randomly chosen file when spreading — could be music, video, or documents with confidential company info.

Exchange: Allan Fels



Allan Fels made world headlines when he took on Sony's use of copy-protection technology — and won.

The chairman of the Australian Competition and Consumer Commission (ACCC) is already ahead in the battle to break down the entertainment industry's disc zoning restrictions. Now he has drawn a line in the sand, daring anyone to step over it.

Why did you intervene in the Sony case?
The Sony case was the first test of the new anti-circumvention provisions of the Copyright Act. The proceedings were taken by Sony against an individual involved in modifying the region coding in PlayStation consoles. Sony was hoping to convince the Federal Court that "chipping" breaches the anti-circumvention provisions. On the surface, this case seemed to be about whether or not region coding is an anti-piracy measure, but the ACCC recognised the broader consumer aspects of the case. If Sony had succeeded in its action against the mod chipper, consumers would be prevented from using games they legitimately own. It is common for consumers to buy games from overseas as there are a lot more titles available outside Australia, sometimes at more competitive prices.

Will the success of your arguments in the case have broader implications?
Consumers have been getting their PlayStations chipped for years, but the legality of doing so was thrown into doubt when the digital agenda reforms were introduced in March last year. At that time, Sony wrote to many chipping businesses putting them on notice that chipping may breach the new Copyright Act provisions. As a result, a lot of businesses closed down and consumers would have found it difficult to get their consoles modified so they could play imported games. The Federal Court's judgment should remove any doubt in the minds of consumers and chippers as to the legality of performing such tasks. From a commercial perspective, I think the judgment sends a clear signal to the owners of intellectual property that if they want to protect against piracy, they are going to have to come up with measures that don't infringe on consumers' legitimate rights.

Are companies such as Sony allowed to deny a warranty claim on the basis that the player has been "chipped"?
The warranty issue is an interesting one. Our view is that chipping would not automatically void a warranty, unless it can be shown that the installation of the chip subsequently caused some defect in the console which has resulted in it being inoperative.

Sony has released music CDs that will not play in PCs (and even crash some systems) in order to prevent piracy. Is this fair?
The Commission acted quickly upon learning of the release of affected CDs into the market to ensure that consumers were informed of the existence and effect of the technology. It's not fair if it causes damage to the PC, and that is something that the record companies need to be prepared for. Consumers have been able to play CDs in their PCs for quite a while, so there is an expectation that they will continue to be able to do so.

If music companies intend to alter consumers' rights then they need to be up front about doing so. If it is a legitimate anti-piracy measure then I don't believe that there is anything to stop them from using it, although I did read recently that there has been a considerable amount of consumer backlash against those record companies using the technology.

What's your role in digital copyright and the increasing use of anti-piracy technology?
The ACCC believes that advances in technology generally benefit consumers, however they also present some competition and consumer protection concerns. We are in the midst of a spate of trade liberalisation and the ecommerce boom, so consumers now have unprecedented access to goods from all over the world. But the benefit of these developments is being lost because copyright owners are imposing technological restrictions on the use of imported products.

We want to ensure that technology isn't used to unfairly extend intellectual property rights to the detriment of consumers. The ACCC appreciates that creators have rights conferred by legislation aimed at rewarding them for their efforts, but it is important to remember that users also have rights under the same laws.

The Copyright Act makes it illegal to make or supply a device designed to circumvent digital copyright protection. When is it okay for consumers to circumvent hardware or software to gain legitimate access to digital media?
I believe the law is very clear regarding what you can and cannot do with hardware or software. If what you are tampering with is a measure that exists for the purpose of preventing or inhibiting copyright infringement, then that is illegal. Unfortunately the law does not look at the consumers' motive for accessing copyright materials, so the fact that you never intended to make an unauthorised copy of the material is irrelevant. It is important to note that the prohibition in the Copyright Act is on making or supplying a circumvention device or service, not actually installing it, so what Parliament is trying to do is crack down on the commercial supply of devices which aid piracy. The issue of circumventing for the purpose of making fair use of protected materials is an issue which is currently being hotly debated all around the world because of the impact on users' rights. EOTE

Is it legal . . .

For retailers to advertise a price on their Web site then try to charge more when you go into the shop?

Making any false or misleading representation about price is against the federal and state consumer protection legislation. Retailers don't have to intend to mislead you — advertising the wrong price for any reason is against the law. It's no different across print, radio, TV or the Web. The old "Bait and Switch" scam — enticing customers with a sale price then offering something different when they arrive — is just as illegal online as offline.

A retailer can defend against prosecution if they can show they used due care. For example, it's not their fault if you pull up an outdated Web page from a cache somewhere. But if they host an old Web page that consumers are likely to look at, they could be in trouble. Retailers also have to take reasonable steps to ensure their advertising is current and correct. Since the Web is continuous and real time, corrections need to be made more quickly than with other mediums.

Consumers can report bad Web ads to their State Fair Trading Department, who can prosecute or warn the retailer depending on their assessment of the case. Strangely, even if they nail a retailer for misleading advertising, you're still not entitled to the lower price.

Snapshot: Tech trends at a glance

ATHENS GAMES CANCELLED



Oblivious to our own growing pains, Greece is learning of the perils of unleashing inept legislators onto the Internet. A ban on all public gaming, including PC and console games, was overturned by the Greek court, who ruled it unconstitutional. Until the ban was reinstated. The saga continues — updates at **www.gameland.gr/index2.htm.**

BETA BUZZES OFF



But have no fear, there are a growing number of format clashes to follow. Toshiba, for example, is working on a next generation DVD format that would be incompatible with one from the Sony crowd. How helpful.

OH THE GLOOM



No kickstart in sight yet for technology sales. Chip sales have picked up in the second half of 2002, but third-quarter earnings were expected to be in the lower end of earlier forecasts. Meanwhile, IDC has cut its forecast for worldwide PC shipment growth in 2002 to 1.1%.

WHO WANTS 3G?



Not many, say researchers at A.T. Kearney, who report only one-quarter of Aussie phone users plan to upgrade to the faster data network. Not surprising really, given no-one here has seen it yet!

AUSSIES AT THE TOP

Net users squabbling over domain names can either take heart or despair over this news. The Net's leading names board, the Names Council of ICANN, has appointed as chairperson Bruce Tonkin from Australian domain shop Melbourne IT. Another Aussie, Paul Twomey chair's ICANN's government advisory board.

SPAM SHAME



It just won't go away. Anti-spam service provider Brightmail now estimates 36% of all email on the Internet is spam, up from 8% a year ago. Hotmail accounts are particularly vulnerable, rapidly clogging up and rendering some accounts useless.

NOTEBOOKS ARE GO



Toshiba's July notebook sales hit record levels with the company shifting 13,988 units for $42 million in sales.

PENGUIN PICKLES



The tactics of players in the Linux market space are increasingly coming under scrutiny as the push for profits butts against the principles of free software. Three examples: UnitedLinux combine ran a "closed beta test" of the final product; Red Hat packages an "Advanced Server" whose configuration is on a fee for service basis; and Lindows charges for files that arguably should be free under the GPL.

Data Dump

Quote file

"My company spends more than your country (on R&D)"

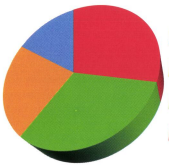
Intel CEO Craig Barret – September 2002



Intel's chief takes a dig at the lack of money spent on tech research during a recent whirlwind visit to Australia. For the record, the chip giant spends US$4.5 billion on R&D, while Australia manages US$3.5 billion.

Number crunch

REASONS FOR BUYING LINUX SERVERS



From a recent worldwide survey of more than 200 CIOs.

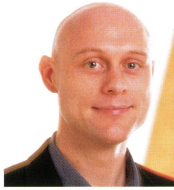
$4,924.9m

Before tax profit of Information Technology and Telecommunication specialist businesses, 2000-2001. The previous year: $7,520 million.

Source: Information Technology, Australia, ABS

THE BIGGEST LOSERS:

Wholesale trade	⇩	(down $1,349 million)
Computer services	⇩	(down $641 million)
Telecommunication services	⇩	(down $612 million)



US war on sharerists

Warner Bros. US and a powerful industry lobby have created a nightmare for our Net access.

> We have received information that an individual has utilized the above-referenced IP address at the noted date and time to offer downloads of [Austin Powers Goldmember] through a "peer-to-peer" service.
>
> The attached documentation specifies the location on your network where the infringement occurred, the number of repeat violations recorded at this specific location, as well as any available identifying information.
>
> Since you own this IP address, we request that you immediately:
>
> 1) Disable access to the individual
> 2) Terminate any and all accounts that this individual has through you.

This is an extract from an email sent on behalf of Warner Bros. in the US, to an Queensland-based ISP. It's the first known case of a US company dictating to an Australian ISP what to do with P2P pirates.

Warner Bros., along with all Motion Picture Association of America (MPAA) members, plus the Record Industry Association of America (RIAA), now routinely hire digital mercenaries who use custom tracking software (**www.mediaforce.com**) to hunt down pirates. When you are finally busted downloading *Goldmember* or the latest Britney single, the evidence against you will be compiled for the authorities to prosecute you for violations of the Copyright Act. And that's if you're lucky.

On top of heavy fines, you could find your computer equipment damaged by a legally sanctioned attack from the entertainment industry, and barred from ever getting connected to the Internet. How do you feel about that Eminem single now? But let's back up.

The Warner Bros. letter is the start of a global campaign by the entertainment industry to protect its property. These sorts of "cease and desist" letters have been commonplace in the US for roughly six months, and are applied with such care that they made news when UUNet was similarly bullied to pull the plug on an account because it mistook a child's book report on Harry Potter as being a breach of copyright.

But this is just the canapé for what the authorities and industry have in store. And yes, what happens in the US does affect Australian Internet users. Washington lawmakers are about to pass a new bill that makes it legal for corporations to unleash worms, viruses and DoS attacks if there is "reasonable suspicion" you are breaching copyright conventions.

According to the P2P Piracy Prevention Act (**http://thomas.loc.gov/cgi-bin/bdquery/z?d107:h.r.05211:**), copyright holders would have the right to disable, interfere with, block or impair a peer-to-peer node suspected of distributing their intellectual property without permission. No probable cause or warrant required.

This nifty legislation was drafted by Congressman Howard Berman, a long time friend of the RIAA and MPAA. For the period 2001-2002, Berman enjoyed $195,000 in "campaign contributions" from the entertainment lobby to represent its interests in Congress (**www.opensecrets.org/politicians/industry.asp?CID=N00008094&cycle=2002**).

The Queensland ISP is in the process of seeking legal advice about how to respond to Warner Bros. Dispatch spoke to the president of the NSW society for computers and law, Michael Park. And guess what? The ISP should be crapping itself.

The Berne Convention on artistic works provides for copyright laws to be respected internationally. "If something is hosted in Australia and breaches US copyright, a US company can take action in Australia to enforce its copyright," Parks said. So, if someone in Australia downloads *Goldmember* or Madonna, the ISP has to do something because a US company says so? "Yes. The message to ISPs is that there are risks of being commercially hurt by cease and desist letters from US companies."

Could they launch a DoS attack? Not yet. "They can take infringement action locally, but there is no [Australian] law that currently gives them the right to launch a DoS attack," says Parks.

RIAA's local affiliate, ARIA, says it is happy with the court remedies provided in the Copyright Act Digital Amendment, and has no current plans to push the US tactics locally. But ...

"I'm convinced the Federal Government would be quick to act if there was a dramatic change in behaviour [of copyright abusers]," says ARIA investigator Michael Speck. "It's clear this government is very supportive of copyright protection."

To say that the entertainment lobby should control new technologies to protect its copyright would elicit coughs of "bullshit". This from MPAA head Jack Valenti: "The growing and dangerous intrusion of this new technology, threatens an entire industry's economic vitality and future security," he told the House Judiciary Committee in 1982. He was talking about videocassette recorders and took a case against the Sony BetaMax to the Supreme Court. If Jack got his way, many pundits have noted that we wouldn't have VCRs, video stores, and Hollywood could kiss goodbye about half of today's income.

... your computer could be damaged by a legally sanctioned attack ...

Don't make Dispatch say that kickbacks from industry to US Congressmen are shaping the Internet landscape; permitting already grossly irresponsible corporations to commit unfettered vigilante justice that casts the public as guilty before innocent while hindering technology developments under the misguided hubris of protecting copyright; wasting the resources of ISPs and ultimately affecting access costs with added resources needed to deal with every automated letter sent on a whim.

Because it's just about protecting copyright. Really.

gmontgomery@apcmag.com



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Cobalt RaQs

model	processor	RAM	hard drive	quarterly	annual
RaQ4	450mHz	64MB	40GB	$1,199	$3,990
RaQ4	450mHz	128MB	40GB	$1,349	$4,490
RaQ550	1gHz	256MB	40GB	$1,649	$5,490
RaQ550	1gHz	512MB	2x80GB	$2,249	$7,490

Dell PowerEdge 1650 with Redhat Linux

model	RAM	hard drive	quarterly	annual
PIII 1.13 gHz	256MB	18GB	$2,500	$8,600
Dual PIII 1.13 gHz	512MB	2x18GB	$3,300	$11,300

Dell PowerEdge 1650 with Windows 2000

model	RAM	hard drive	quarterly	annual
PIII 1.13 gHz	256MB	18GB	$3,000	$10,200
Dual PIII 1.13 gHz	512MB	2x18GB	$4,000	$13,600

New!

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eBayer beware

Dealing with troublesome traders on eBay can be hard enough without eBay itself playing hard to get.

Dear Watchdog,
I bought a computer on eBay Australia, but when it arrived it wouldn't run and it even had a smaller processor than advertised. I emailed the seller and gave him three options: take it back, reduce the price, or get it fixed. He said: "you got what you paid for, mate". I prepared a claim from eBay's insurance (including organising documentation from an independent technician that cost me over $50).

eBay confirmed they received the claim and indicated the review process could take up to 45 days. Well, it's been over 70 days and I'm starting to think I've been ripped off a second time.

If the insurance isn't adequate for online trading, what's stopping people just putting in false ads to make some fast cash?

Jeremy Thompson
Goonellabah, NSW

The insurance scheme Jeremy applied for is part of eBay's efforts to make online auctions safer for buyers. So what was the problem?

Dear Watchdog,
After investigating Jeremy's case, eBay confirms that unfortunately there has been a delay in responding to his fraud protection program claim. Whilst eBay does everything possible to process claims within 45 days, occasionally delays occur.

Regrettably, eBay did not contact Jeremy to advise him of the delay in processing his claim. The appropriate team within eBay has now emailed Jeremy to apologise for the delayed response.

The team has also been asked to ensure that all eBay members are contacted in a timely manner to advise them if delays occur in processing claims in the future.

Whilst Jeremy's case is an unfortunate incident, it is important to note that the vast majority of buyers and sellers at eBay Australia are honest and reliable.

99.9% of all transactions on eBay are completed successfully [based on the number of confirmed fraud complaints against all successful listings]. Our eBay community members also play an active role in policing the site. They are proud of their involvement with eBay, and appreciate the value of eBay's friendly and secure trading environment.

If our members see something amiss on the site, they are encouraged to report it, much like the successful police Neighbourhood Watch programs.

Sharon Scheepers
eBay Australia and New Zealand
Marketing Director

Within hours, eBay emailed Jeremy and assured him they were working on his case. The formal verdict arrived two weeks later: "We are pleased to inform you that this claim has been found on

Email password security concerns

Dear Watchdog,
I am writing to express my concern over the security on the Westpac Altitude Rewards Web site. I recently activated my online account using my email address, date of birth and credit card number. Now I just type in my email address and date of birth to view my points along with details of every credit card transaction I've made over the last three months. I typed in my DOB and redeemed a Toys'R'Us voucher just to see if it was really this simple.

I phoned Westpac, but they didn't see a problem and had no idea how to de-activate my account. I emailed the site and 'Elle' replied: "The email address you choose to have registered on your online Altitude account does not have to be a real email address. You can create any email address you like. In doing this you are using a "password" known only to yourself. While we do send a "welcome" email when you first register on the site, there is no other correspondence sent to this email address."

Nowhere do they say the email address is actually a password (why encourage people to use a fake address then send them an email anyway?). Although any voucher I buy is posted to my address (which is also listed), they can spend it all on charitable donations.

How can a bank like Westpac screw up something so simple as a password? I am a senior Web developer and if I ever made public a Web site with this "security" I would deserve to be sacked. In fact, I would resign in embarrassment.

Keiron Throssell
Beldon, WA

10 step online auction survival strategy

By the time victims of online auction fraud contact Watchdog, the money or the goods are usually long gone and there's very little anyone can do. Online auctions continue to be one of the largest sources of Net fraud. Auction sites insist they're just a platform for traders and aren't responsible for the actions of individual sellers and buyers. Traders argue the company has a responsibility to make their market a safe place. It's up to you to watch your back, so before you even think about trading online, get yourself a game-plan.

1. **Keep your cool.** Impulse buying, panic bidding and failing to allow a cooling-off period could land you in trouble.
2. **Know what you want.** Buying a $10,000 server just because the top bid is $1,200 is a waste of money unless you planned to get a server anyway.
3. **Research the market.** Study past auction results and monitor current items over a seven to 14 day period (use keyword searches and check different categories where other buyers might not look). Compare the online auction prices to other retailers or marketplaces.
4. **Set a price limit and stick to it.** Factor in shipping costs (and currency conversion if the seller is overseas).
5. **Know who you're dealing with.** Email questions directly to the seller and find out all relevant product and personal information (without breaching privacy).
6. **Protect your good name.** Use the feedback system to learn the trading history of the seller (remember to post feedback after the sale for others to use). A good reputation is worth dollars. Protect your name by always being honest, upfront and polite. Some retailers use eBay to offload old stock and have established business reputations.
7. **Plan your bid.** Keep your eye on rival bidders and intensive bidding periods. If you suspect Bid Shilling (phoney bids made to boost the price), walk away. Take special note if an item has been listed more than once. Bid as late as possible to avoid inflating the price and consider buying outright if that option is available.
8. **Agree to payment terms.** Credit card payments and Escrow services (where the buyer sends payment to a third party, the buyer receives and approves the goods and the third party pays the seller) are the safest ways to pay. However, credit isn't usually available and Escrow is expensive. Many people rely on direct debit methods. This is the riskiest part of an online auction and you may have to fall back on the reputation and honesty of the seller.
9. **Take delivery.** Shipping costs usually fall to the buyer. Consider Registered Post for extra protection.
10. **Keep print-outs and records at every stage of the trade.**

www.eBay.com.au/help/buyerguide/

your behalf. A claim check will be issued in the amount of US$162.65 through eBay, Inc."

But what about the seller? Was he still at large on eBay? Section 5.3 of eBay's user agreement outlines penalties for bad behaviour. Punishments range from an outright ban to a temporary suspension or a caution.

Watchdog asked eBay what they planned to do. eBay's Community Development Director Kaye Dewar said they examine the circumstances behind each case before they pass any judgement. "For privacy reasons we don't share the actual actions being taken with anyone else, except for the police, if that was required."

Jeremy checked the seller's status on eBay and discovered the account was now inactive. Could a person that had been banned continue to trade using a fictional or stolen identity? "We have various mechanisms in place that we use to detect people that have less than good intentions," Kaye said.

eBay however doesn't reveal details of its verification and protection measures.

"Obviously if people understand what they are they can try and work around the system. When it comes to these safety mechanisms we don't share how the various tools work — just like a bank wouldn't."

Jeremy plans to investigate the background of sellers more closely in future trades. He's an experienced eBay trader and was careful to check the seller's rating before this sale took place — two negative ratings and over thirty positive in this particular case. "I thought I was safe. But you never know, do you?" FITTH

Dear Watchdog,

We appreciate and welcome customer comments on our products and services, particularly feedback on where improvements can be made or which features our customers like. Our research indicates that loyalty programs are considered a low risk to acts of fraud, and the use of the date of birth to validate accounts was considered appropriate.

Email addresses as logon identification was selected for its ease of use and convenience to customers. However, we are currently reviewing the Altitude site, in particular the level of security. In an instance of suspected fraud on the Altitude site, as with all credit card transactions, a thorough investigation would be undertaken by the bank and any fraudulently lost points would be re-instated to the customer.

Skander Malcolm
Westpac Senior Manager, Credit Card Products

Keiron sent Watchdog some words of wisdom he found on Westpac's online banking site: "When selecting a new password, do not use characters which represent all or part of your birthdate or which can be easily recognised as part of your name, or a combination of both.

This is to lessen the risk of fraudulent transactions, by someone guessing your password and using it to access your accounts."

Contact us @ **We want to know how IT companies are really treating you. Write to watchdog@apcmag.com. Include your full contact details and any product information. All correspondence becomes the property of *APC* and is subject to editing.**

Switchers not a turn-off

Nice article on "switchers" (*APC* September, page 14). I have to say that I would switch today to Mac if the prices were closer to a PC. I remember back when the first Apple was released, a lot of engineers like me were choosing the direction we would go. Most of us were heading toward Apple rather than IBM, TRS80, or Zorba, etc,.

Where Apple lost the plot was in its price point. When the clones hit the market, there was simply no contest. As engineers, we all knew that Apple made a better machine. It was rock solid, well designed and planned with the user in mind. But even then, we could build two complete, decent clones for the price of one Apple. Now all these years later, that's still pretty much true. Back then, I really wanted to get interested in Apple and Mac architecture. And all the way up to now I still want to — as soon as they can produce a machine that is priced much nearer to the PC market.

I think they're getting close, and if they keep dangling Unix (and Linux) in the front line, I might bite the bullet and be a switcher anyway.

Richard Saint Clair,
Niue Island, South Pacific

Price has often been suggested as the primary stumbling block to Apple's ambitions. Some budget-conscious Mac fiends have detailed their experience of building a G4 clone at ***www.macopz.com/buildamac****.*

DON'T SHOOT THE MESSENGER

Having read Warren Greenwood's letter in *APC* September (page 22, *Control, conflict and chaos)*, I think he needs to educate himself to the world of online realities.

I too lost a much-valued email address when my former ISP was bought out by my current provider. I also had to change username, as my former name was already assigned on the new domain. Deal with this, it's a fact of life.

If Optus decides to discontinue the **Optushome.com.au** domain for business reasons, you can either cope with the change or vote with your feet and move to another provider.

Regarding spam, blaming Optus for it is very likely putting the blame in the wrong place. As the Optus response pointed out, spam email is often addressed to multiple addresses with very similar details. This does not mean that you are getting other people's email, nor they yours.

Optus can only act against spammers operating from accounts inside their own domain, and given the hit-and-run tactics spammers adopt, even this is difficult.

Until suitable legislation and enforcement capabilities are developed to stop spamming, the best way to deal with spam is email filtering, or to use a program such as Mailwasher to delete spam from the server before downloading.

However, don't blame the ISP for delivering mail addressed to you, just because you later decide you don't want it. That would be like blaming Telstra for providing the phone line that direct marketing pests call you on.

In both cases, the provider simply provides the information pathway; they're not responsible for the content of the message.

Scott Pankhurst
Townsville, QLD

Letter of the month

In the university where I both work and study, we're looking at handing out either OpenOffice or licensed copies of StarOffice for student, and maybe staff, use. We debated the merits of both, arguing that StarOffice had a database while OpenOffice didn't.

After some quick research, we discovered that both Star *and* OpenOffice had databases; StarOffice has its own "SDB" format (which we already knew) whereas the OpenOffice philosophy is to not create a new proprietary format, but instead to read from multiple "data sources": including dBase, Adabas, JDBC, ODBC, ADO, Text, Spreadsheet and Addressbook.

The interface looks rather Microsoft Access-like (2000, at least), down to the Table and Query design views and the SQL transliterations.

I've not yet experimented with this, but according to an OpenOffice FAQ, OpenOffice will open Access "MDB", after the downloading and installation of the Microsoft Jet Database Engine; relevant links to the MDACs and Jet engines are provided on the OO page.

The user-level "how to create a database" documentation can be found at **http://documentation.openoffice.org/HOW_TO/data_source/data1_EN.html**. The OpenOffice Whitepaper discussing their rationale/design philosophy roadmap is at **www.openoffice.org/white_papers/01061 7OOoRoadmap.html?JServSessionIdservl ets=2i3wbaonq1**. Section five deals with the Database Access.

Peter Petroff
Brisbane, QLD

WHICHEVER SUITE PETER IS USING, he'll certainly appreciate having 128MB of portable memory storage on tap. As the winner of *APC's* Letter of the Month, Peter wins a compact Cruzer USB Flash memory reader, complete with a 128MB SD Card. Supplied by FlashMemory (*www.flashmemory.com.au*), the total prize value is $308.

Hardware hassles? ISP hang-ups?
Have your say in APC's annual Service & Reliability Survey!

Share your experiences about desktops, notebooks and ISPs. The good and the bad, the winners and the sinners — we want to hear from you. The survey closes midnight, Thursday October 31, and there are some cool prizes to be won.

- **Adobe Photoshop Elements 2.0**
- **Sony MicroVault 16Mb USB memory key**
- **Microsoft multimedia keyboard and wireless optical mouse**
- **Rome iRiver Slim X MP3 player**
- **Woodslane computer book packs**








APC's 2002 Service & Reliability Survey: have your say at www.apcmag.com/s&r2002



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You'll want to design everything.

Nothing will be safe. Not a memo. Not a note. Not the tags on every piece of luggage you own. With CorelDRAW® Graphics Suite 11, we can't blame you for wanting to design every single thing that pops into your mind.

Reshape objects freely with pressure-sensitive Roughen and Smudge brushes. Mask complex shapes in one step with an ingenious new CutOut tool. Minimize and reuse design elements with new Symbols support.

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Epinions

FLOPPY FREE . . . OUT OF MY TREE

Thank you for a very timely series of articles on hard drives — I just had an 80GB Maxtor Viper die on me. If only I'd had a backup (sigh). I'd have been reasonably okay if I'd even had an Automated System Recovery Disk — this is what Windows asked for anyway. Problem is, my system is "legacy free" i.e., USB instead of serial, DVI instead of VGA and no floppy drive! A full reinstall of XP Pro later, I faced the mammoth task of creating a backup on a system with just a CD burner. Boy, was I in for an education!

1 Windows XP does not backup to CD.

2 Everything I found for creating a rescue set required creating a boot floppy.

3 Norton Ghost creates a boot floppy in order to work.

4 The disk utilities on Maxtor's Web page create a bootable floppy for testing hard drives.

I surrendered in the end and now I've got a floppy drive. A suggestion? It would be nice if you guys had a *bootable* rescue disk as a front cover disk — or failing that, a comprehensive article on how I could create one myself.

Alan Campbell
Via email

BOOT CHAMP

After dealing with Windows in its many forms for the last 11 years, I have come to the conclusion that at some stage you have to bite the bullet, reformat the hard drive and install Windows again (although the latter versions are not as bad as the earlier versions).

I have discovered a Web site (**www.nu2.nu/bootcd**) which describes in great detail how to create bootable CD-ROMs. The best part is that you can take your original Windows 2000 or XP CD and apply the latest service pack to the install files (using `update.exe -s:<dir>`) — then burn a new CD so that when you reinstall the fresh version of Windows it is updated without the need to apply the service pack.

Adam Birch
Sydney, NSW

TRASHED FLASH

The article on reclaiming Palm Flash ROM space reserved for the OS (*APC* September, page 144) failed to address a possible pitfall. Some Flash ROMs are only intended to be flashed a limited number of times (e.g., 100). You can expect to toast the ROM after the specified number of flashes, therefore killing your Palm. I don't know what sort of Flash ROM is in the Palm, but readers should bear in mind that using ROM as RAM is not without some risk!

Scott Martin
Via email

VICTIMS OF ADSL, PART 23

I know that everyone has their Telstra stories, but I want to share my recent experience.

A small business owner rang me to come and install the ADSL modem Telstra had supplied to him. On arrival at his premises I found that he had a single-port Home ADSL modem with a single ADSL line filter, and that his phone system consisted of a Siemens PBX with five extensions and two incoming lines on a rotary.

My first thought was that this was not the correct kit for his setup, but he assured me he had informed Telstra of his telephone setup and that this was the kit they thought appropriate. Better check it out with Telstra ADSL technical support.

Call one. I'll write this one off to it being a high school student on work experience — it's the only logical explanation. I was informed that the ADSL modem did not have to be plugged into the phone system at all!

Call two. ADSL would not work with the existing phone system, particularly because of the rotary facility for incoming calls. Another line would have to be purchased and dedicated to the ADSL connection. Not convinced I decided to try again.

Call three. The modem could be connected to one of the five extensions, but all extensions would have to have an ADSL splitter/filter. As only one splitter/filter was included in the supplied kit, I asked how I could obtain the extra four. I was assured they would have been supplied in the kit. But they weren't.

The business owner would have to purchase another kit and it was not clear if he would receive a refund on the first. Dissatisfied with this answer I steeled myself for a fourth opinion.

Call four. Because there were five extensions on the phone system, a filter should be fitted in the PBX itself rather than a filter on each extension. Any more than five extensions and this would not be possible. I was advised that it would be better to pay Telstra $249 and have their technician install it. I agreed!

Agenda:

your place to vent

Current broadband pricing within Australia is ridiculous. Although if you add up the extra costs of a phone line and what not with a dial-up connection, broadband is virtually the same price. But for most, the bare minimum 300-500MB download/upload limit is simply not enough, forcing you to upgrade to the more expensive plans. Broadband providers wake up — you are the true culprits for the slow take-up of broadband in Australia.

Robert Candelori,
Via email

Prize Pit



SEPTEMBER SUBSCRIPTION WINNERS

Each month *APC* gives you the chance to win free goodies if you become a subscriber. See page 128 for details. The lucky winner of our September subscriptions competition is **P. Grace** of **Greystanes, NSW.** He has won an Acer Travelmate Notebook, valued at over $3,499.

I informed the owner that, having wasted a morning that I would not bill him for, and having had four different pieces of advice from Telstra, he should pay Telstra the $249 to have them install it because they would have to get it right, one way or another. At this point in time he is still waiting for the technician to appear.

Colin Halliday,
Via email

Four phone calls for no noticeable result? Time to buy some Telstra shares.

Correction

In last month's roundup of managed PCs, our review of the Dell Optiplex GX260 (p102) mistakenly listed the system's processor as being 1.8GHz rather than 2GHz. The pricing for the GX260 as tested is $1875.

Have your say

We welcome comments and suggestions. Send email to: **apc@apcmag.com** or write to: **Epinions, *APC* Magazine, PO Box 4088, Sydney NSW 1028.** Letters can also be submitted online at **apcmag.com**. Or join the *APC* Discussion Forum at **www.apcmag.com**. All correspondence becomes the property of *APC* and is subject to editing.

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Shoot. Touch. Share.
Well, so much for the instruction manual.



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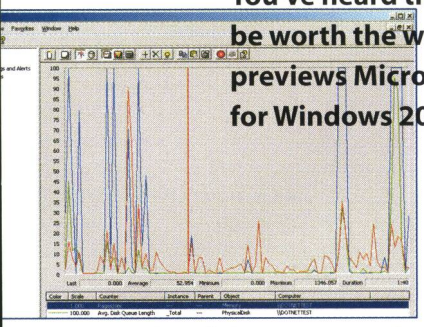
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On Test

Reviews, First Byte, Tech Briefing, Real Deal, Labs Challenge

Reviews

30 Windows .NET Server
You've heard the hype, but will it be worth the wait? Matt Overington previews Microsoft's replacement for Windows 2000 Server.



32 Acer n20 and s60
Palm OS or Pocket PC? Acer is putting a dollar each way, but neither handheld quite goes the distance.



34 Hewlett-Packard Deskjet 5550
Want photo printing at a bargain basement price? If you don't mind a bit of noise, HP's latest Deskjet could be the answer.

35 AOpen AX4B-533 Tube Motherboard
Yes, it's a mobo with a vacuum tube! But unless your PC sports very high-end speakers, it's only worth it for the novely value.



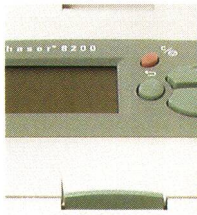
38 Windows XP Service Pack 1
Downloading this first bug-fix for XP makes sense, although some features can be a little confusing.

40 Sony VAIO PCG-GRX3P
The flagship VAIO sports a massive 16.1in display but that's not enough to make it a must-have.



42 Adobe Photoshop Elements 2.0
Adobe has produced another winner for the growing consumer graphics market with Elements 2.0 — a "Photoshop for the rest of us".

44 Pioneer 5800P
It may have seemed a good idea at the time, but Pioneer Computers' big-as-Texas notebook suffers from all the wrong compromises.



46 Fuji Xerox Phaser 8200DX
This Fuji Xerox solid ink printer delivers fast, affordable colour printing for the small office.

48 IBM ThinkPad X30
It's lightweight, robust and has a great battery life. What's missing? CD and floppy disk drives.

50 Hercules 3D Prophet Radeon 9700 Pro
Powered by ATI's Radeon 9700, this Hercules card is easily the new king of 3D.



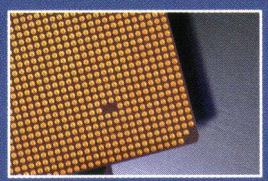
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Kodak's latest digital camera flounders as digital photography zooms ahead.

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How does AMD's next-gen CPU bridge the gap between 32-bit and 64-bit computing?



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From sub-$1500 budget beaters to $5,000+ dream machines, *APC* Labs tests 56 desktop PCs.



.NET, or not yet?

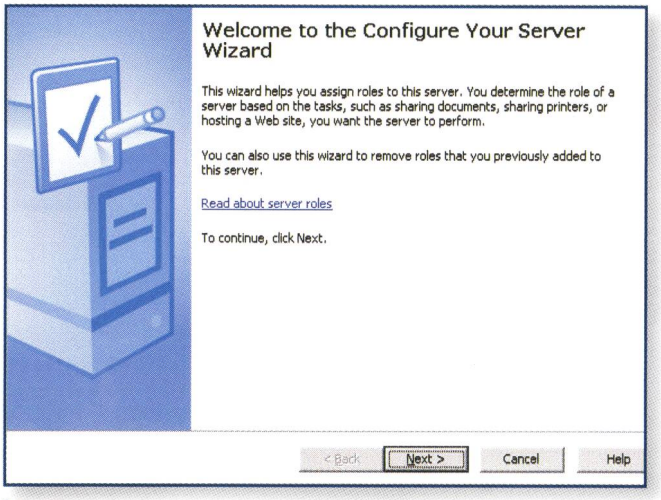
***Matt Overington* has been getting hands-on with Release Candidate 1 of Microsoft's replacement for Windows 2000 Server.**

Microsoft's hunger for OS domination doesn't end with the desktop. Far from it. The entire .NET strategy is designed to redefine intranets and the Internet, in a pincer movement between the desktop client (Windows XP) and the server side, by way of .NET Server.

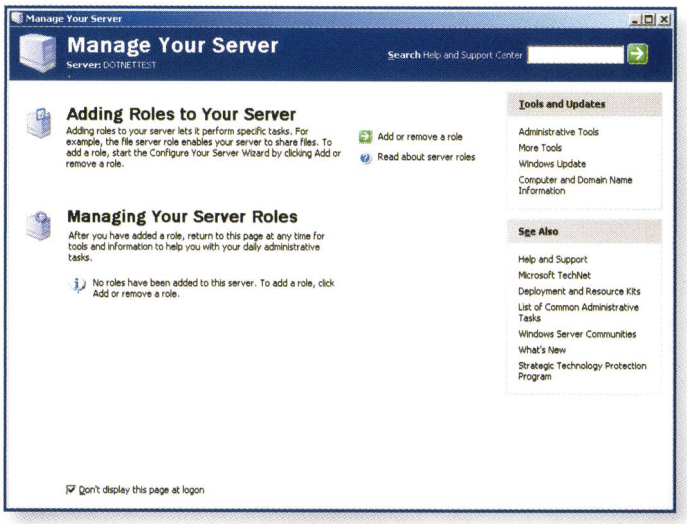
The release schedule for .NET Server has slipped perhaps more often than any Microsoft product, and been subject to longer cycles of betas and release candidates. The reasons range from technical teething troubles — unavoidable for any project of this scale, let alone first forays into the uncharted territories of .NET — to seemingly endless red alerts over the security of Microsoft's platform.

Most importantly, Microsoft knows they have to nail this first build. It doesn't have to be perfect — it certainly won't be — but it's got to be as far from imperfect as the Redmond code jockeys can manage. For all these reasons, Microsoft has remained tight-lipped over.NET Server's final release date. However, there's historically been three to four months between the first release candidate and the final sign-off. Based on this timetable, *APC* expects to see .NET Server go gold around the start of 2003.

As it happens, the longer Microsoft waits, the more dated Windows 2000 Server becomes. Under the terms of Microsoft's technology guarantee, Windows now has a five-year lifespan for company support, after which it becomes an OS orphan. This gives Windows 2000 Server an official use-by date of February 2005, although there's a substantial market of third party companies willing to support Windows 2000 after that date. But many companies will be looking more keenly than ever at .NET Server, both as a replacement server platform and a testbed for seeing what this whole Web services push is really all about.



.NET Server: *caters to both the newbie and super-administrator with both wizards and powerful command line tools.*



Quick start: *configuring server roles takes all of five minutes.*

PC POWER VS BIG IRON

There are an enormous number of improvements between Windows 2000 and .NET that make the server more scalable, reliable and interoperable. Foremost among these are enhancements to Active Directory deployment, migration tools, group management tools and security.

Microsoft has fully embraced Web services with its .NET platform, and .NET Server goes one step further towards integration at the OS level: all versions of .NET Server come with the .NET framework built-in.

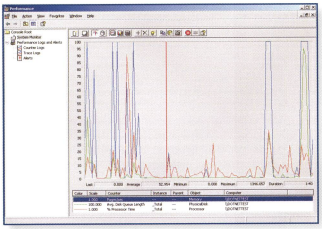
Having all but conquered the desktop with its Office suite, Microsoft's aim is now on the "back office". Several years ago the company co-opted the term BackOffice for its server family. Now the company is seeking to leverage PC processing power, bringing what the company calls "PC economics" to the datacentre. .NET Server supports eight-node clustering (double that of Windows 2000 Server), 32 processors and up to 256GB of RAM. This is rapidly approaching the raw computing power of traditional "big iron" Unix systems, but without the associated price tag.

MANAGEMENT MADE EASIER

Active Directory 2.0 is far easier to work with than Active Directory 1.0, thanks mainly to the introduction of a new range of AD tools. The current version includes: drag-and-drop capabilities — to populate directories and manage users; the ability to edit multiple objects simultaneously; and a full suite of command line tools to script procedures. The new AD Management Tool facilitates migration from NT4 and Windows 2000 servers.

The complexities of system management were a common complaint among Windows 2000 administrators. New wizards to manage and configure the server help define the roles that the system will play. This is an obvious benefit for less-experienced system administrators. Remote Installation Services have been added to quickly push .NET Server onto a number of smaller servers.

The Group Policy Management Console makes for easier group policy changes over a large number of users. Tasks can be scripted from the



Updated performance monitor: *one of many tools improved between Windows 2000 and .NET.*

command line, saving countless kilometres of mouse travel and thousands of mouse button clicks.

Finally, Microsoft has realised that in the move to GUIs, much of the power of the command line interface was lost. Windows 2000 included a few powerful command line tools, but came nowhere near satisfying the wizard-loathing amongst us.

Although Windows .NET Server includes a number of wizards for the beginner Sysadmin, the real power is held in the command line tools. Group policies, Windows Management Infrastructure and configuration systems can all be scripted, which dramatically speeds up the amount of time wasted on arduous and repetitive tasks.

Following on from its much-publicised Trustworthy Computing push in January, .NET Server is Microsoft's poster child for server security. At the heart of the system is a Software Restriction Policies (SRP) feature that lets administrators define which applications can be run in a given environment. Virtually all parts of the OS can be locked down to restrict unauthorised access. Internet Information Services (IIS) is disabled by default to help quell any backdoor access. Some services, like NetworkService and LocalService, have also had some privileges reduced, lessening their impact on the system.

THE 64-BIT SERVER

The 64-bit Windows Advanced Server/Limited Edition, released in June 2001 as the OS tag team partner to Intel's Itanium platform, has been rolled into 64-bit editions of Windows .NET Enterprise Server and Data Server, both of which will be released in the first quarter of 2003. Microsoft will support both AMD's x86-64 and Intel's IA-64 architecture in future 64-bit versions of Windows XP and .NET Server, with an upgrade for the Itanium2 due around June 2003.

With 32-bit x86-based servers scaling well, and 64-bit machines remaining expensive, Microsoft's backing of 64-bit is a mandatory nod to the future. The company doesn't expect a rapid uptake of .NET Server's 64-bit editions, and neither does *APC*. It's cheaper to throw a handful of 32-bit servers onto a network and distribute their computing power rather than add even a single 64-bit box.

STEP UP, OR STAY PUT?

It's impossible to make a judgement based on anything but final release software, however a spanner in the works will be .NET Server's refusal to work with Exchange 2000. This is going to make the majority of IT administrators slam on the brakes until the release of Exchange 2003 (codenamed Titanium), slated for mid-2003.

Allow time to evaluate that major update on its own, and factor in the financial need to forecast well ahead for a corporate-wide upgrade, and any company with a Microsoft backbone is unlikely to switch over to .NET Server until the second half of 2004 — two years from now! That provides plenty of time to evaluate .NET Server or sit back and let someone else be the guinea pig.

If you're using NT4 Server and have been looking to step up to Active Directory, leverage some of the new command line tools, or integrate XML Web services into your business, then a move straight to Windows .NET Server could be in order.

For those running Windows 2000: if you have a need for some of the new features found in Windows .NET Server then you'd be well placed for an upgrade. Microsoft has not finalised pricing or the release date for Windows .NET Server, but expects it will be extremely close to that of Windows 2000 Server editions. EDITOR

Four fruity flavours

WINDOWS .NET WEB SERVER

The lowest spec version of .NET Server is a stripped-down installation optimised for serving and hosting Web pages. It supports two processors and up to 2GB of RAM and includes Microsoft's IIS6, ASP.NET, and IPv6. The biggest limitation of Web Server is that it can't act as a domain controller in an Active Directory domain. This means that it can't be used to manage other PCs on the network.

WINDOWS .NET STANDARD SERVER

The core of .NET Server, aimed at small- to medium-sized businesses. It's limited to running on machines with two processors and 4GB of RAM, which is ample for most system administrators in charge of smaller networks. You get all the features of Web Server Edition, with extra functions to make it suitable for the back office. These include UDDI services, Fax Services, Remote Installation, Public Key Infrastructure, Certificate Services, Windows Media Services and Terminal Services.

WINDOWS .NET ENTERPRISE SERVER

This is serious server stuff. It supports beefier machines with four to eight processors and 32GB of RAM, and up to 8-node clusters. Enterprise Server is a slightly gruntier version of Standard Server, with added support for Metadirectory Services (MMS), and hot-swappable, hot-addable memory. The Non-Uniform Memory Access (NUMA) model is also supported under Enterprise Server, which is also available in a 64-bit version.

WINDOWS .NET DATACENTER SERVER

Microsoft has pulled out all the stops for its flagship .NET Server. Available in 32-bit and 64-bit versions, it supports from 8-32 processors, up to 64GB of RAM and 8-node clusters. Currently there are no 32-processor machines to take advantage of Datacenter's capabilities, but Microsoft is ready for any future developments. It doesn't have Internet Connection Firewall facilities, and lacks Enterprise's Metadirectory Services support, but includes Microsoft's Datacenter Program.



Acer doubles its hand

Palm OS or Pocket PC? Acer is putting a dollar each way, but neither quite goes the distance.

The handheld community and the manufacturers have drawn some pretty decisive lines in the sand — you either belong to the Palm OS camp (Palm, Handspring, Sony) or Microsoft's Pocket PC brigade (HP/Compaq, Toshiba).

But with new handhelds in both Palm OS and Pocket PC flavours, Acer doesn't care which platform you choose — as long as it bears its label.

ACER N20

Is the market ready for another Pocket PC? Acer certainly hopes so, and has made some effort to stand out from the crowd. The company's offer of an on-the-spot exchange warranty (provided you bring your handheld to the one authorised Acer exchange centre in most capital cities) will generate feel-good points among consumers, especially those who've read of Palm's less than stellar service record in recent issues of *APC*.

Another unique offering is the Memory Stick slot, which supplements the 64MB onboard and replaces the more standard and cheaper CompactFlash cards favoured by other Pocket PC makers. A 64MB Memory Stick costs around $120, compared to $75 for a CF card of the same size. If you've already got some CF cards on hand, you might want to consider the optional clip-on expansion jacket which accepts both CF and SD cards.

Alas, where the n20 immediately loses to both the Toshiba and iPAQ offerings is on first sight — it's undoubtedly the blandest Pocket PC on the market. The device also feels bulky in the hand, being quite wide to hold.

A more serious flaw is the stylus. It doesn't sit in a silo like most other handhelds, but slides into a recess on the side of the n20. It doesn't even sit flush with the case, and quite a few times worked itself free when being carried in a pocket or bag. As we were testing a production sample, this is a problem we hope will be fixed before the first shipment lands.

The unit's screen is oddly placed, being slightly off centre to the right. Viewing is good, with a clear and bright display, although reds and yellows appeared quite dull. Sensitivity on the screen is pleasing, with no tracking problems detected, although the multidirectional navigator button needs too much pressure to activate.

While on paper the Intel 400MHz PXA250 processor sounds dashingly quick, the well-reported limitations of the Pocket PC 2002 architecture mean that only some 75% of this power can be used. Hopefully a flash upgrade to the next revision of the OS will unleash all the horsepower on tap.

ACER S60

The s60 enjoys good looks, neat features and pleasing performance, but like the n20 it suffers from a few frustrating design problems. Aimed more at the person who prefers convenience over performance, the s60 demonstrates there's still life in the PalmOS platform. It fits comfortably in the hand and has a build quality that's of a very high standard, although the buttons on the front panel had a somewhat cheap feeling and lacked any feedback upon being pressed.

As with the Sony CLIÉ, the s60 can play MP3 files through a supplied set of headphones, but as the audio connector atop the unit isn't standard, you'll want to be sure not to lose the supplied headphones. We also found that the earphone connector was knocked out of its socket almost every time the s60's cover was flipped open. At least with the s60, Acer went for a more traditional approach to stylus design, with a 115mm aluminium stylus housed in a top opening silo.

As with the n20, Acer's Palm accepts a Memory Stick for adding extra storage beyond the inbuilt 16MB. Just don't expect lightning-fast file transfers — a 4.5MB MP3 file took over six minutes to download from the PC to the s60.

Packaged software with the s60 includes the AudioBox audio player, WalkReader ebook viewer and Photowiz for viewing images. All these applications need separate installation by pushing out onto the s60 PDA

The s60's display — while not quite as large as the n20 at only three inches — is exceptionally clear and easy to read, with a bright backlight activated by holding down the on/off button.

Having lived with the s60 for a week, we had the impression that a few too many corners were cut in the design and testing phases in Acer's eagerness to bring this otherwise pleasing unit to market.

Ashley McKinnon

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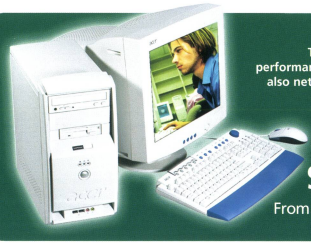
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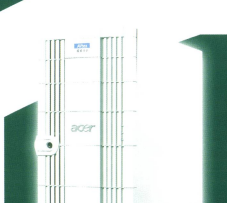
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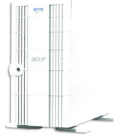
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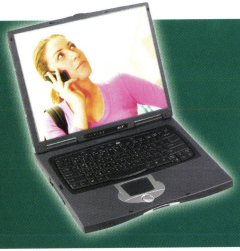
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Cheap thrills

Want photo printing at a bargain basement price? If you don't mind a bit of noise, then the HP Deskjet 5550 could be the answer.

With the Deskjet 5550, HP has attempted to bring the same features as found in high-end inkjet printers to the home/home office user. Have they succeeded? Yes they have, but at the expense of speed and ongoing costs.

The printer itself is made entirely of plastic, with the only metal being used for rollers and a base plate. All the components fit together nicely and the printer does feel well constructed. The rear of the printer has a removable portion allowing further access to the inside of the printer and the rollers.

The rear also houses the I/O connectors in the form of both USB and Parallel. However, HP supplies neither cable, adding an extra expense for the purchaser. The front of the printer has a 100 page paper tray, which automatically senses paper size. The paper out tray can hold up to 50 pages.

PERFORMANCE

The printer utilises two ink cartridges, but both seem too small for this printer. The black cartridge is rated at 450 pages while the tri-colour cartridge (CMY) is rated at 400 pages. We found that after printing 60 pages — both colour and monochrome — that each of the cartridges reported just over 70% full.

Going on these statistics, 400-450 pages does not look attainable. At $50 and $75 for the black and colour cartridges respectively, the expenses will quickly grow if you are constantly printing. With a maximum resolution of 1,200 x 1,200dpi for monochrome printing, the Deskjet 5550 competes against many laser printers in terms of output quality. We compared the output of a standard text page, with around 5% text against a HP Laserjet 1200, also at 1,200 x 1,200dpi and we were unable to find any differences in print quality.

We did notice however, was that the Deskjet 5550 has a very short paper path around the main roller, which tends to curl the paper upon printing. A small gripe, but it can be annoying if you are printing several pages. We also noticed a few instances of spotting — where ink is randomly dropped on the page. These were the size of a pinhead but could still ruin an otherwise perfect print.

The 5500 couldn't live up to HP's speed claims either, and we were only able to achieve 13 pages per minute (ppm) while printing the simple Windows test page, well short of the 17ppm touted by HP.

PHOTO OUTPUT

Colour printing from the Deskjet 5550 is almost as impressive. While printing photos, the colour matching was almost perfect, with only a hint of variation noticed in some shades of red. All edges and lines were sharp and clear, with no bleeding of overlapping colours.

For users with photo images over 1,200dpi, HP also offers a photo cartridge which replaces the standard black cartridge. This adds another three colours, totalling six, to the printout and boosts the maximum print resolution to 4,800 x 1,200dpi.

We tested this with HP's colourfast paper using several 1,600dpi digital photos and were amazed at the quality. When compared to actual processed photos of the same image, no visible difference was evident. The downside is such high-end colour printing is slow, with those photos taking just over four minutes per page to print.

Standard colour printing on stock grade paper was much quicker. Several colourful PowerPoint presentations were printed, but still the best speed we could achieve was around 2ppm. Even my bargain-basement Epson C40UX inkjet managed the same printouts at around 4ppm.

NOISE LEVELS

This printer won't win any awards for quiet operation either. The printheads rattle around as they pass back and forth over the paper, while the whole paper feed mechanism goes through quite a few clunks getting the paper ready and feeding it through.

Turning off the automatic paper size detection in the driver software not only speeds the paper feed process, it also cuts down on the noise. Unfortunately, the noise will probably get worse as the plastics begin to wear.

VALUE FOR MONEY

You can't argue with the price of the Deskjet 5550. At only $295 it represents great value for money, even when you take into consideration its few niggles and problems. For the home user or home office user, the Deskjet 5550 would represent a sound investment.

However, if you will be printing colour on a consistent basis, you may find the cost of replacing cartridges well before their expected life cycle a little too expensive.

Ashley McKinnon

Details >>

Contact Hewlett Packard
Phone 13 23 47
Online www.hp.com.au
Price $295
Verdict



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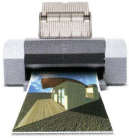


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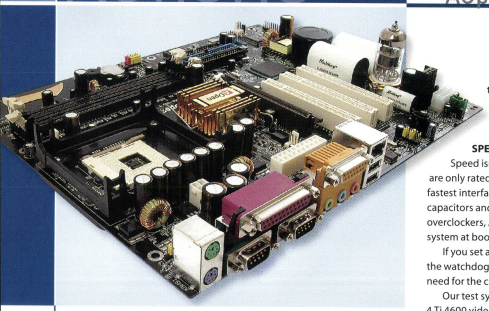
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CIPG00103/A



Tubular tones

An improved audio capability is let down by the need for high-end speakers to realise the sound.

Innovation is what we live for, but when a motherboard manufacturer embraces older technology to create a "better" product, we have to sit up and take notice. With the AX4B-533 Tube, AOpen has incorporated tube audio technology into the motherboard to achieve greater sound reproduction, but it left us wondering if it's worth the $599 price tag.

AUDIO

The main drawcard for this motherboard is, of course, the tube audio. Utilising the Sovtek 6922 Dual Triode Tube (though any similar dual triode tube can be used), sound can either be configured to be output from the tube or from the onboard Realtek AC'97 codec. By outputting through the dual triode tube, AOpen claims you will achieve richer, fuller and deeper sounds. Never believing anything we're told, we tried various audio examples to see if any difference could be heard.

We tested with several games and yes, the sound was definitely better. More detail could be heard and the overall quality had a cleaner sound to it. Music playback however, didn't sound any different than through the integrated AC'97 controller — a disappointment as we're sure this was the area the AOpen were targeting. The onboard AC'97 controller is, at best, only an average perfomer, but is still capable of 5.1 channel audio with some amazing effects.

Also, when the bass control was turned up the sound started to distort, which you wouldn't expect from such an expensive motherboard. Admittedly, we only tried the AOpen AX4B-533 Tube motherboard on a set of five Altec Lansing 251 speakers. Though these speakers are high-quality, they could hardly be classified as professional — which is what would be needed to realise the tube technology's full potential.

SPEED

Speed isn't exactly the AOpen's friend either. The IDE connectors are only rated at ATA100 speed, not ATA133, which is the current fastest interface technology. Only three PCI slots are available, as the capacitors and diode for the tube take up quite a bit of space. For overclockers, AOpen includes a watchdog utility which checks the system at boot up.

If you set a frequency to high and the system hangs, upon reboot the watchdog facility will reset BIOS settings to default, negating the need for the case to be opened and the CMOS reset.

Our test system comprised a Pentium 4 2.8GHz, Gainward GeForce 4 Ti 4600 video and 512MB of DDR-RAM. 3DMark 2001 Pro produced a respectable benchmark score of 10,653.

DR VOICE II

Another feature of the AX4B-533 Tube motherboard is DR Voice II. This is a BIOS-level diagnostic utility that checks the system for problems during system start-up. If a problem is identified, a voice will tell you what is wrong. While this sounds great, in practice the voice is nearly impossible to distinguish — the only word we were able to decipher was "problem". This was not very helpful, as we couldn't make out what the problem was. But for those that want to persevere, several different languages can be selected for the voice output.

Ever the innovators, AOpen has also included a CD player that's available at boot time. Simply holding down the Insert key after the POST runs brings up the player interface, so you can listen to audio CDs without the hassle of booting into Windows. Yet another gimmick but handy nonetheless.

PRICE

Price is where the AOpen AX4B-533 Tube motherboard comes crashing down to earth. At $599, it hardly represents good value for money, and it doesn't even perform that fantastically.

Yes, it is an innovative motherboard, but is this innovation really necessary? The popular answer would be no, but I'm sure there are those who welcome the adoption of tube technology.

For those who don't want to spend twice as much on a motherboard because of some gimmick, you'll just have to make do with transistor audio. As to which is better, it's never been scientifically proven either way, but for us, price is the deciding factor.

Ashley McKinnon

Details >>

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Chipset Intel 845E
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Price $599
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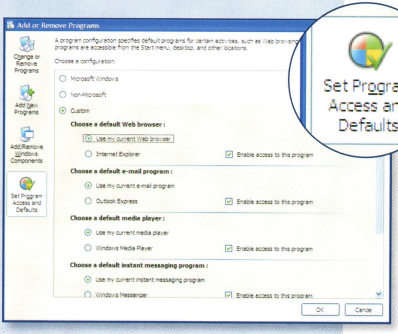


There's one nearly empty. Do you throw them all away?

Many inkjet printers, even some quite expensive ones, combine several different ink colours into one cartridge. When one colour runs out, you have to throw away the whole lot. Most Canon models use inexpensive separate tanks for each colour. They also have an advanced ink monitoring system that alerts you on-screen when any of the colours are getting low, so no more running out of ink halfway through a document. You'll find a new Canon Bubble Jet saves you time, and probably enough money to buy a decent bottle of wine or two. For more information, visit www.canon.com.au or call 1800 021 167.



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Set Program Access and Defaults: *lets you choose whether or not to show common Microsoft programs in XP.*

The SP1 installer gives you the chance to back up system files which SP1 replaces. You can uninstall SP1 and go back to square one if you wish, for which you'll need about 150MB of free space (the backup files are stored in a hidden directory named $NtServicePackUninstall$ in the \WINDOWS directory).

Depending on what hardware is installed in your system, after installing SP1 you may find some drivers have been disabled. If this happens, Windows XP will pop up a "balloon" warning and usually point you to Windows Update to get a more recent driver for the device. This happened on one machine we tested, but the solution involved nothing more than fetching an updated driver and rebooting.

Please XPlain

Downloading this first bug-fix for XP makes sense but the Program Access feature is confusing.

Windows XP is easily the best version of Windows yet, but that's not to say there hasn't been room for improvement. In the months following XP's launch, Microsoft tweaked, fiddled, rewrote and patched problem after issue after bug.

The cumulative weight of all that software spakfilla has grown to the point where it's no longer practical to download dozens of separate fixes. To simplify refreshing XP, Microsoft has rolled the whole tamale into Service Pack 1. For the most part, SP1 is very good — it installed seamlessly on all the test systems we tried — although the new Program Access feature is far from straightforward.

TWO SIZES FIT ALL

You can download XP SP1 through XP's Windows Update service or head directly to the SP1 home page (**www.microsoft.com/windowsxp/pro/downloads/servicepacks/sp1**). There are two options for how to download and install SP1.

Express Installation is channeled through Windows Update, which polls your machine and downloads which parts of SP1 you need. That makes it the best option if you don't have a lot of bandwidth to spare, although Microsoft still warns that a "typical download" is some 30MB.

If you've got more than one PC to update, and plenty of bandwidth, grab the Network Installation pack. This serves the whole of SP1 in one giant 134MB package, perfect for burning to CD or deploying across a LAN.

CHOOSE YOUR APPS

Aside from all the under-the-hood fixes, SP1 includes the new Set Program Access and Defaults window, which resides in the Control Panel's Add/Remove Programs applet and also gets a guest spot atop the Start Menu. This is part of Microsoft's response to make Windows XP more compliant with the terms of its antitrust settlement with the US Justice Department.

The intent is to let you choose Microsoft or non-Microsoft programs for Web browsing, email, instant messaging, digital media playback and Java. Non-Microsoft programs don't always appear in the drop-down list of applications however, as third party apps need to be written to expose themselves to the relevant OS hooks. Some already are — for instance, Netscape 7.0 with AOL Instant Messenger shows up in Program Access as both a Web browser and email client.

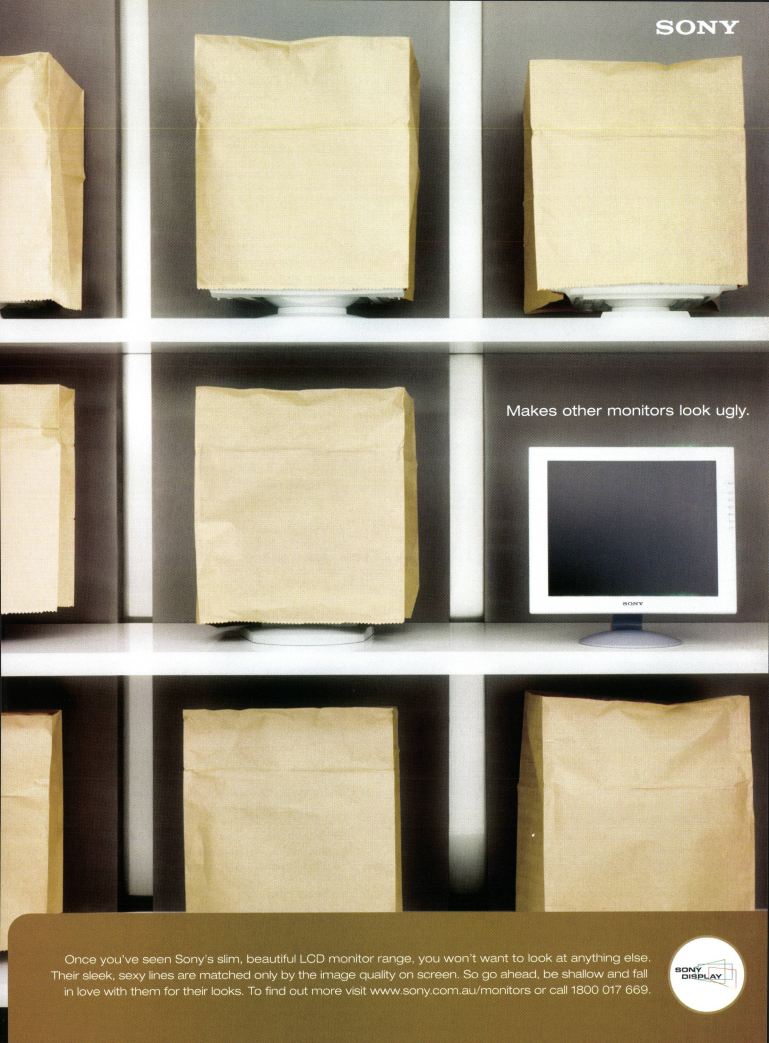
Note that this feature doesn't remove any of the Microsoft programs from your PC, it merely stops them being the default application for the specified task. The way this is all laid out lacks clarity, although the more you play with it, the more you understand it. But you should really only mess with it if you *want* to hide Microsoft programs completely from view.

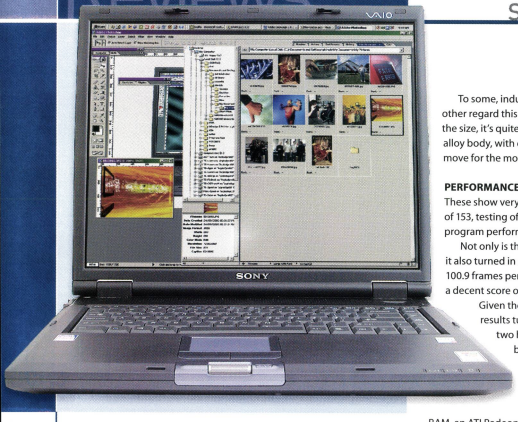
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Details >>
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Online www.microsoft.com/windowsxp/pro/downloads/servicepacks/sp1
Price Free
Verdict ●●●●○

Spyware in SP1?

One odd piece of controversy that has surfaced is the alleged presence of the Alexa "spyware" product in IE6 when SP1 is added. We've looked into this and it turns out that Alexa is *not* bundled with IE6 or SP1. SP1 simply refreshes (or adds, if it's not present) a Show-Related Links option under the IE6 Tools menu, which is where Alexa itself plugs into if it's already sitting on your system. Some spyware-cleaning programs, like AdAware, overreact to the presence of the Show-Related Links option, leading people to think that some spyware has snuck on board.


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SONY DISPLAY



Wide screen narrow appeal

It may be powerful with a good feature set and a massive screen, but this VAIO hardly stands out from the crowd.

The line between your standard desktop PC and the desktop replacement notebook has unquestionably blurred when it comes to the Sony VAIO PCG-GRX3P. And it's about more than just performance, connectivity and features. Now, it's about sheer size.

The screen on Sony's flagship is a massive 16.1in UXGA TFT panel, making this easily the largest notebook you can buy. The display is very impressive, displaying awesome vibrant colour, with the brightness and contrast expected of an A-grade panel in all its 1,600 x 1,200 splendour. But it begs the question: for a notebook, just how big can you go before it's *too* big?

To accommodate the screen, the chassis of the VAIO also commands serious desktop real estate, measuring 355 x 44.4 x 292mm (WHD) and weighing 3.6kg. This makes it all but unmanageable if you're on the move.

These specifications add significantly to the weight of the VAIO, which uses an elaborate cooling system to dissipate heat throughout the upper section of the keyboard and the back of the body. It achieves this successfully and the entire surface of the notebook stays quite cool during use.

Even when considered on its merits as a pure desktop replacement, the VAIO comes off as an impractical exercise in indulgence. If you are after a larger display, it's not necessary to sacrifice mobility — a simple VGA port can be provided at the back for a larger desktop PC screen, with a smaller more mobile screen on the notebook itself for those important road trips.

To some, indulgence is not always a bad thing and in every other regard this notebook is a fine piece of technology. Despite the size, it's quite stylishly clad in an understated dark magnesium alloy body, with chiselled lines and simple flat surfaces — a sensible move for the more sedate corporate environments.

PERFORMANCE BENCHMARKS

These show very favourable results, with a solid SysMark2002 score of 153, testing office applications and multimedia content creation program performance.

Not only is the VAIO primed for mobile multimedia action, but it also turned in some very solid gaming results, posting a smooth 100.9 frames per second in the OpenGL Quake 3 Demo001 test, and a decent score of 4,128 in 3DMark2001 for Direct3D performance.

Given the large screen and powerful specs, BatteryMark results turned in a fairly average result — the VAIO lasting two hours and seven minutes under the standard benchmark workload.

At the nucleus is the excellent mobile Pentium4 1.6GHz-M processor. Not the fastest available, but certainly no slouch in the mobile arena. It comes stocked with a full 512MB DDR-RAM, an ATI Radeon 7500 Mobility graphics processor with 32MB dedicated video RAM and a 40GB hard drive.

PERIPHERALS

Media is handled by the useful DVD/CD-RW combo drive and is complemented by a Memory Stick port. Peripheral devices in PC Card format can be added via the PCMCIA Type I/II or III slot, such as an 802.11b card for wireless networks, or perhaps Bluetooth to communicate with other gadgets. For a flagship model, however, Sony could well have offered at least one of these features onboard.

For connectivity, it features LAN and modem ports, as well as video and audio out, three USB ports and i.LINK (IEEE1394) for external devices such as portable hard drives, DV cams and digital still cameras. For compatibility with older devices and printers, the VAIO also offers the standard parallel and serial ports.

Small but reasonable stereo speakers sit above the keyboard, which has large keys, firm action with plenty of space for resting palms without knocking keys or brushing the touchpad mouse.

Apart from the touchpad, it is also equipped with a scroll wheel and a small back button for more specific control when browsing the Net. The Sony VAIO also comes with a host of preinstalled Sony DV editing software on the Windows XP Professional OS.

In summary, while it's a powerful notebook with a solid set of features, it's difficult to see how it really stands apart from other flagship offerings from Toshiba or IBM.

The huge screen is appealing in some respects — for instance DVD playback or gaming — although on its own, there may not be enough to distinguish the VAIO from others when 15in screens are more than ample and features are on par or even better.

Ashok Zaman

Details >>

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Verdict ●●●●○

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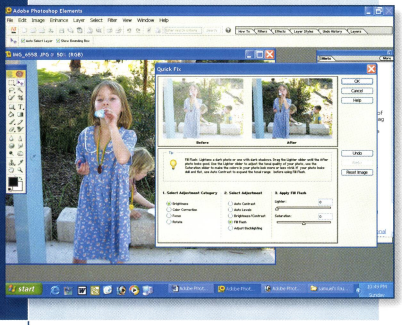
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FJT0009_APC

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Adobe Photoshop Elements 2.0



▶ ***Quick fix:*** *see how your changes will affect your image before you commit.*

Elemental graphics

Adobe has produced another winner for the growing consumer graphics market with Elements 2.0 — a "Photoshop for the rest of us".

Photoshop Elements 2.0 is a refinement on version 1.0 with improvements in the interface as well as a couple of new features to satisfy new users and more experienced digital image workers.

RECIPE FOR SUCCESS

The use of Recipes, or "show me how" instructions for specific tasks, allow you to work at your own pace, letting the guidelines show you certain tasks if required. However, like any good recipe, the tools allow you to experiment or leave the confines of the instruction process once you feel more confident in your abilities. This distinguishes Elements from 99% of consumer-based graphics programs that force you into a regimented wizard-esque interface.

For example, a Recipe is used to retouch an old photo using Layers, an advanced feature that may confuse some users. The recipe guides you through the selection of a layer and the application of an effect. If you become confused as to where a tool is, click on the hypertext "show me" and the program takes over. If on the other hand, you become more familiar as to where the Layer pallet is, you can go straight there yourself.

Photoshop Elements 2.0 doesn't really have any ground-breaking new features that will blow you away, however the refinements to existing features make the program a much more effective tool. Access to lighting and colour correction features are now available through the Enhance drop down menu, with an improved colour adjustments tool allowing you to see before and after images based on changes in colour, brightness and contrast.

NEW TOOLS

The one-step to resize and attach images tool is a great time saver and would be a good feature to include in the high-end Photoshop 7.0. Simply click on the "attach and send" icon and the program automatically converts the image to JPEG, resizes the file to an appropriate size for email and attaches the file to an email.

The new file browser is a powerful tool, particularly when dealing with a lot of images, as it lets you preview, sort and organise images in thumbnail form without actually opening the files.

The Selection Brush masks unwanted areas of a photo for accurate editing, while new paintbrushes now simulate oils, watercolours, charcoal and pastels, providing similar tools to Corel Painter 7.

Users can now create PDF slideshows that can be displayed on any device that supports the Adobe Acrobat Reader software. This includes Palm handhelds, Pocket PCs and any system running Windows or Mac OS.

BUT IS IT ANY FASTER?

Image editing is a very demanding application which can exact a hefty toll on your PC. We ran a series of speed trials comparing Elements 2.0 to the original 1.0 release (with Adobe's Pentium 4 update) as well as Photoshop 6.02 and Photoshop 7.0.

The test system was based on a Pentium 4 2.8GHz with 768MB of RD RAM, and an 80GB IBM Deskstar 7,200rpm hard drive with the scratch disk set at 50% available memory.

The first two tests applied a Gaussian Blur of 8.5 pixels and a resizing from 300dpi to 72dpi on a 100MB RGB image. These represent everyday tasks for imaging professionals.

TEST RESULTS

	Elements 1.0	Elements 2.0	Photoshop 6.02	Photoshop 7.0
Gaussian Blur	4.2 sec	3.8 sec	4 sec	3.6 sec
Image Resize	3.5 sec	3.2 sec	3 sec	2.8 sec
PDF-PSD Conversion	1 min 15 sec	1 min 5 sec	1 min 12 sec	1 min 8 sec
Pointillize Effect	8 sec	5 sec	6 sec	5 sec

We also carried out a multipage conversion of a 100 page 2.5MB PDF into 100 native Photoshop PSD pages, which provides a good test of file opening, closing and conversion speeds; and applied an intensive Pointillize Filter effect of 10 pixels on a 25MB RGB image to test each application's raw image-processing speed.

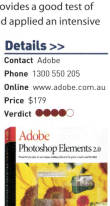
As you can see, Elements 2.0 recorded a marginal edge over the 1.0 release, although not enough to warrant an upgrade from 1.0 on speed alone. In our limited tests, Elements 2.0 also kept pace with the full-blown and more expensive Photoshop.

Photoshop can do a lot that Elements can't, such as four colour conversions, action support and pre-press — but if you're happy with the tools that Elements 2.0 gives you, it's a bargain.

Denis Gallagher

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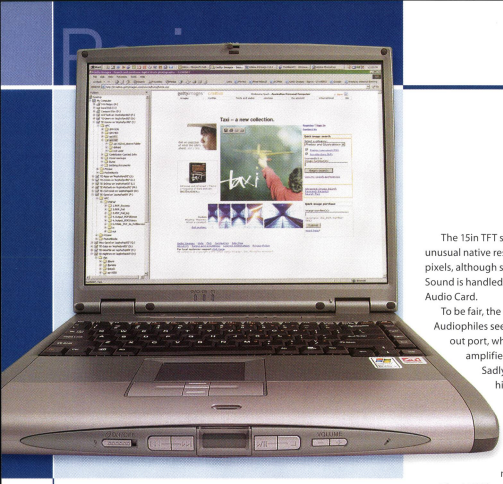
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FJT0039_APC

intel inside pentium III



Big mistake

It may have seemed a good idea at the time, but Pioneer Computers' big-as-Texas notebook suffers from all the wrong compromises.

Big. With the Pioneer 5800P notebook there's no escaping the word. Everything about it is *big*, starting with a Yeti-like footprint and a massive fan-cooled power supply. It's also a *big* disappointment.

For the 5800P's power plant, Pioneer Computers — not the same company that makes lush home entertainment gear — opted for a 2.2GHz Pentium 4 desktop processor rather than the P4m mobile version. While less expensive and more powerful than its road-ready cousin, the desktop chip places a substantially greater load on the electrical and cooling systems. The end result? A lot more heat and a lot less battery life.

DISAPPOINTING FEATURES

Using the power-management disabled BatteryMark 4 test, the 5800P sighed its last breath after just over one hour of use.

Two large cooling fans force air over the hot internals, and almost one side of the notebook is entirely given over to vents. This could lead to dirt or dust getting into the laptop in environments. At least the laptop screen hinges — a common source of breakage with cheaper laptops — are remarkably sturdy.

Mated to the CPU is 256MB of DDR-RAM, coupled with a 64MB ATI Mobility Radeon 7500 graphics card. As expected, the Mobility Radeon performed quite well in our 3DMark tests, with a score of 4,797.

The 15in TFT screen appears bright from most angles, and the unusual native resolution of 1,400 x 1,050 provides more than enough pixels, although some may prefer a wider aspect-ratio screen. Sound is handled by the Dolby 5.1 capable Via Avance AC97 Audio Card.

To be fair, the 5800P does boast some very sensible touches. Audiophiles seeking static-free sound will like the digital audio-out port, which also allows you to digitally connect to an amplifier with a set of sub-woofers, centre and rear speakers. Sadly, the 5800P skimps on acoustic engineering; at higher volumes the onboard speakers aren't able to hit those solid bass tones.

Power users will appreciate the generous inclusion of four USB ports, while FireWire and S-video out let you edit video footage on the move.

But the single PC Card slot is miserly, as there's more than enough room for two slots.

The 40GB hard disk drive could be considered too small for some media moguls although, as the machine is built to order, this spec can be changed at purchase.

Supported operating systems include Windows 98, Me, 2000 and XP plus Red Hat Linux. According to Pioneer Australia, SuSE and Corel Linux are also suitable but aren't officially supported.

HARDWARE INSTABILITY

Under the pre-installed Windows XP Home Edition, the 5800P failed to finish several programs in our test suite of benchmarks. That these problems continued even after a reformat and reinstall points to underlying hardware instability.

To add to the litany of problems, the laptop is hard to rouse from sleep mode, and the DVD/CD-RW combo drive is very fussy about scratched media — discs that worked in a desktop drive won't play in the 5800P. Inexcusably, the right upper lock on the keyboard kept dislocating due to the case flexing, exposing the fragile innards of the laptop.

But the worst oversight is that the lead of the large, hot and irritatingly noisy power adaptor can be inserted upside down — potentially shorting the laptop's motherboard and frying the internals, or at least blowing a hard-to-replace internal fuse.

What started out as a good idea for a solid desktop replacement or a mobile multimedia workhorse has gone terribly wrong. There's no excuse for this many problems to occur in *any* notebook.

Dan Corkery

Details >>

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Phone (02) 9690 2888
Online www.pioneercomputers.com.au
Price $4,099
Rating



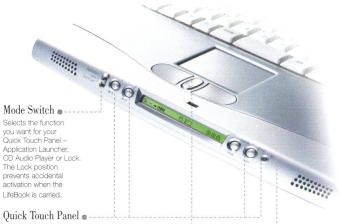
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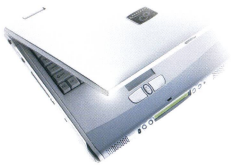
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FJT0039_APC



Phaser set to stun

The Phaser 8200DP solid ink colour printer delivers fast and affordable photo-quality printing for the small office, but beware, it can be very noisy.

By far the majority of colour desktop printers in use around the world are inkjets, but the permeation of colour into the corporate office has been less than universal. Cost is the main problem. Colour inkjet printers are cheap, but when running them at full power in a multiuser environment, replacing the ink cartridges can be expensive. Inkjets are also much slower than colour laser printers. The up-front costs of colour lasers may be high, but they're fast, produce good results on plain paper and are cheap to run. Unfortunately, the photographic output is less than stellar.

The gap between colour inkjet and colour laser closes with the Fuji Xerox Phaser 8200 series of solid ink printers. The Phaser 8200 weighs a hefty 36kg and setting it up is simple, the most taxing thing being to ensure the ink ColorStix are loaded in the correct hoppers. The solid ink is in fact solid coloured wax blocks which are heated and applied to the media. There are four hoppers, and each one has an individually shaped cut-out to allow the ColorStix to be dropped in.

We reviewed an earlier incarnation of the 8200DP, the Phaser 850DX, over two years ago (*APC* July 2000, page 48). The review concentrated on the novelty of the solid ink technology. Recollections of that model include a slow warm-up time (up to 30 minutes) and colour output similar to a colour laser printer. In other words, not that good.

PERFORMANCE

We found that the Phaser 8200DP has a much speedier warm-up time (five minutes) and the output quality has also greatly improved. Previous models claimed near-photographic quality on plain paper, but this is the first model that really justifies this claim.

The driver allows some simple tweaking and colour matching, including Fuji Xerox's TekColor colour correction system and full PostScript Level 3 support. At full resolution the Phaser 8200 offers a 1,200dpi photo finishing mode — and the results are stunning. Plain paper is competent, but Fuji Xerox has a bevy of specialty papers and even transparency film matched to the printer. On high-resolution photo paper the results look slightly grainy, but it nearly matches the best photo inkjet output.

The Phaser 8200DP's real forte is as a colour workgroup printer, a typical office workhorse. It's rated at 17ppm in mono and colour, and comes with a 200 sheet paper tray. We tested the Phaser at normal quality and it churned out a 12 page text document in one minute and 16 seconds, and a 12 slide PowerPoint presentation in just over one minute and 30 seconds. Text was laser quality and the dithering seen in colour laser prints was also evident on some of the charts and diagrams printed on this setting.

RATTLE AND HUM

Some noise is bearable, but what came from this printer was *not*. It's not as bad as an impact printer but the high-pitched mechanical whine emitted as it's about to print a page sounds like a banshee. And the ejection of the sheet into the output tray was akin to a bolt-action rifle ejecting a cartridge.

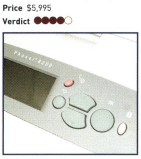
The printer has Ethernet support built-in and the instructions for fitting it into your existing network are straightforward. Parallel and USB interfaces are also provided and the printer will support Windows, MacOS, Netware and various Unix and Linux environments.

Don't be daunted by the costs. ColorStix ink refills range from $172 to $198 for two packs of ink. But the average cost of a colour or mono page works out at three cents per page, which is cheaper than many monochrome lasers or colour inkjets.

David Lin

Details >>

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Online
www.xerox.com/officeprinting
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Verdict



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X marks the spot

It's lightweight, robust and has amazing battery life. But we're not sold on the latest ThinkPad treating floppy and CD drives as an "optional extra".

"How long does the battery last?" That's usually the first question you ask when buying a notebook. For the IBM ThinkPad X30, the answer depends on how many batteries you use. Slide a single cell into this ultraportable ThinkPad and you can expect close to two hours of use (we managed a BatteryMark score of 1 hour and 47 minutes).

Load a second battery onto the chassis (it sits just under the main cell) or in the optional UltraBase docking station and you'll get five and a half hours. And as both of those figures are with power management disabled, the real world figures could stretch close to a whole working day, although you'll need to set aside five hours for recharging.

There's room for three cells — one in the notebook and two in the UltraBase — but oddly enough, the X30 is only able to cope with two of them.

PRET A PORTABLE

While the instantly recognisable IBM styling may not suit everyone's taste, the X30 is a small and robust notebook which typifies what a "portable" should be. The footprint is only slightly larger than B5, yet the X30 feels very solid. Weighing in at only 1.66kg, and partnered with a compact AC adaptor, the X30 is perfect for the mobile professional.

The combination of an Intel Pentium III Mobile 1.2GHz CPU with 256MB of SDRAM pushed the X30 to a Winstone score of 42.1. Video performance from the integrated Intel 830MG — which can be set to use between 8MB and 48MB of shared system memory — was less than stellar with a 3DMark 2001 score of 678, even with the maximum 48MB of RAM allocated, so don't expect to get heavily into games between your meetings.

The 12.1in screen is exceptionally clear with good colour depth. Graphics appear sharp and precise, while text is easily readable.

The IBM Travelstar 40GB hard drive was silent, but at 4,200rpm it's a little slow. External connections include the mandatory pair of USB 1.1 ports, one FireWire port and a single PC Card type II slot.

It's also one of the most network-friendly notebooks you can get: our test unit came fitted with everything from a built-in 56Kbit/s modem and 10/100 Ethernet to 802.11b wireless and Bluetooth.

NO FLOPPY, NO CD

What you don't get are floppy or CD drives, and that's a worry. This means there's no way to get data on or off the notebook, other than via a network. And backing up and recovering your hard drive when away from a network, a topic of vital importance for mobile users, is impossible.

This means you're forced to buy, at least, the external and incredibly expensive USB 1.1 floppy drive ($205) or CD drive ($495). A much better bet would be to spring for IBM's UltraBase docking station, which at $439 gives you a choice between a CD drive or second battery. We know which one we'd pick.

SOLID PERFORMER

Many people sing the praises of the ThinkPad's keyboard, and we agree that it feels nice with good, positive feedback. Full-size keys mean typing errors should be kept to a minimum, but the omission of the Windows key could cause frustration for many. Fortunately, you can remap the keyboard to activate it off another key combination.

A small light embedded into the top of the screen housing provides limited illumination for the keyboard — you'll get more light from the screen when typing in the dark.

The integrated TrackPoint pointing device has just the right amount of travel for correct use.

Starting at $4,299 (our review unit was priced at $4,699) the ThinkPad X30 is certainly not cheap, and it isn't going to break any speed records. But IBM has to be commended for cramming so much into such a tiny frame, and one that's clearly built to withstand the rigours of the road.

Ashley McKinnon

Details >>

Processor Pentium III-M 1.2GHz
Memory 256MB SDRAM
Hard drive 40GB IBM Travelstar
Display 12.1in TFT
Video Intel 840 MG
Operating System Windows XP
Dimensions 270mm x 230mm x 25mm
Weight 1.66kg
Ports 2 x USB 1.1, 1 x FireWire, 1 x parallel
Network 10/100 Ethernet, 802.11b, Bluetooth
Modem MiniPCI
Battery Lithium Ion
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Phone 13 24 26
Online www.ibm.com.au
Price From $4,299 (test model $4,699)
Verdict







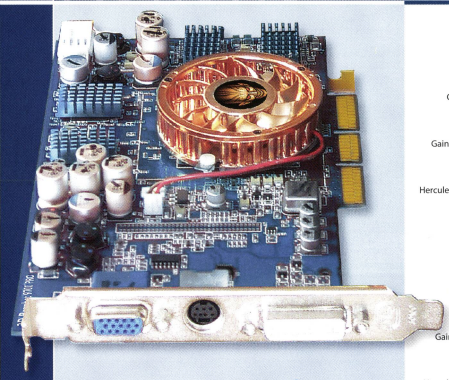
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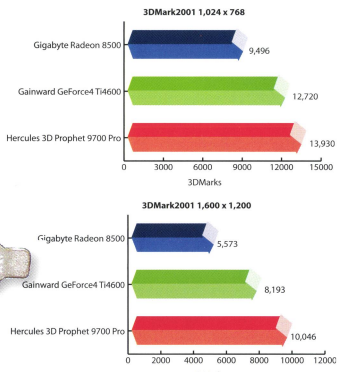
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apc EDITOR'S CHOICE NOV 2002

With eight rendering pipelines running at 325MHz and 18.5Gbit/s of memory bandwidth, ATI's Radeon 9700 is easily the new king of 3D.

ATI has been playing second fiddle to nVidia's GeForce cards for a long time. But the Radeon 9700 changes all the rules, and with it the balance of power in the 3D market.

With over 110 million transistors on a 0.15-micron die, the Radeon 9700 enjoys eight rendering pipelines — twice that of the GeForce4 — running at a core clock speed of 325MHz. Four 64-bit load-balanced channels form a 256-bit wide memory bus for a fat 18.5Gbit/s total memory bandwidth.

And while no monitor supports the Radeon 9700's 128-bit colour, the onscreen image is richer in colour and finer in detail than its rivals. It supports AGP 8x, giving a transfer rate of 2.1GB/s to system memory — again, twice that of the AGP 4x interface on most current cards, including the GeForce4 Titaniums.

The Radeon 9700 can support up to 256MB of DDR-RAM, although it's only available with 128MB at the moment. Clocked at 310MHz DDR, it has a whopping effective speed of 620MHz. Armed with 128MB, the Hercules 3D Prophet 9700 Pro accomplished some of the GeForce4's spanking results.

Using the *APC* testbench, consisting of the AOpen AX4B-533 Tube (see review on page 35), Pentium 4 2.8GHz CPU running on a 533MHz bus and a 512MB PC2100 DDR-RAM, the Hercules posted a 3DMark result of 13,930 at standard settings. This is almost 10% faster than the 12,720 3DMarks of the Gainward GeForce4 Ti4600 when it ran on the same test bed.

Similarly, the Hercules didn't falter at higher resolutions, racking up 11,949 3DMarks at 1,280 x 1,024 and an astounding 10,046 3DMarks at 1,600 x 1,200 — over 18% faster than the Ti4600's 8,193 3DMark result. Clearly, the Hercules 3D Prophet 9700 Pro has Direct3D easily covered.

It was also equally stunning in OpenGL: the Hercules card breezed through the venerable Quake 3 demo, with 171.9fps (frames per second) at 1,600 x 1,200 with the quality setting maxed out. When tested under the Unreal Tournament 2003 demo Flyby test, it obtained 185.4fps and 112.7fps at 1,024 x 768 and 1,600 x 1,200 respectively. Compared to the lowly 77.3fps and 34.3fps achieved by the GeForce4 Ti4600, the 3D Prophet 9700 Pro shows that the Radeon 9700 is the undisputed performance champion.

It also includes SMOOTHVISION 2.0 — allowing up to 6x anti-aliasing — as well as full 16x anisotropic filtering and still gets more than playable frame rates, as 7,235 3DMarks at 1,024 x 768 attests. Finally we have a card that is not crippled when enabling the image enhancements.

The Hercules supports dual-display and comes with DVI and TV-out ports. With streaming media and DVD playback features like FULLSTREAM and VIDEOSHADER, it's also the choice card for video action.

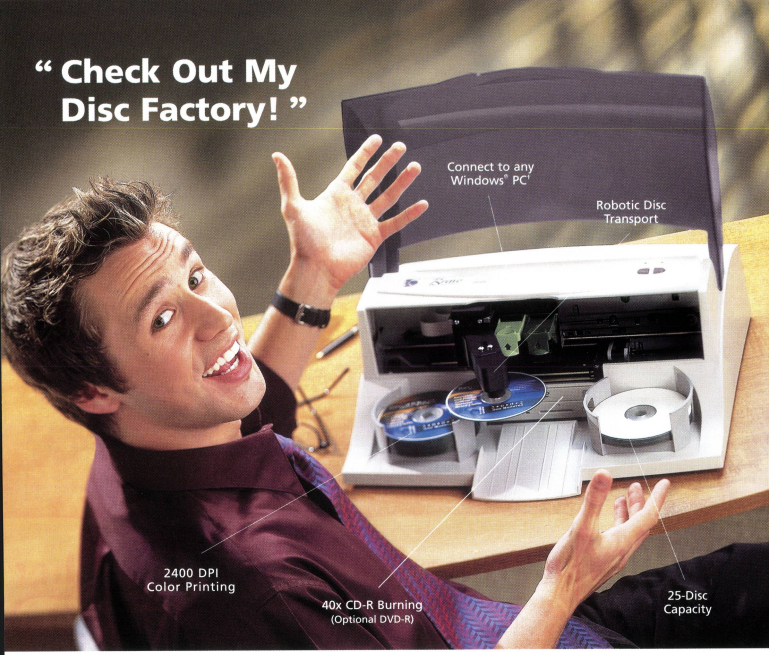
Ashok Zaman

Details >>

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Blast from the past

Kodak flounders as digital photography moves ahead.

Flashback to December 2001: *APC* reviewed the Kodak EasyShare DX3900 (see page 38). Eleven months later, and this uninspiring 3.1 megapixel holiday snapper is attempting a comeback in the shape of the new DX4330.

Improvements include enlarging the LCD by 0.3in to 1.8in, boosting optical zoom from 2x to 3x, doubling memory to 16MB and adding a low-quality video capture mode. But even these advances and some minor cosmetic surgery to the body hasn't changed the similar experience of these two cameras.

Focusing using the LCD remains slightly hazy. This applies both indoors and out, despite the "anti-reflective coating" designed for shooting in sunlight. Zoom is fast and smooth through the optical viewfinder, but be prepared to wait around five seconds to process each shot.

The DX4330 is designed for the first-timer. The idiot-proof onscreen menu and simple dial array reflect the basic set of features. There are five pre-programmed scene settings and limited manual exposure control.

The quality of your final photos relies on the DX4330's automatic point-and-click system. The bottom line: you get sharp, consistent, good quality images across different lighting conditions. Kodak unashamedly claims to be the "most colourful" and your photos will have their trademark over-saturated and vivid colouring.

The EasyShare software has been redesigned to walk beginners through the PC connection process. It automatically downloads and manages an image collection (although this would be easier if Kodak included the cradle). You can tweak exposure and brightness before preparing shots for printing.

The DX4330 is a sturdy three megapixel digital camera for beginners. Nevertheless, even at $500 less than the original DX3900, it's overpriced for what you get.

Fiona Angus

Details >>

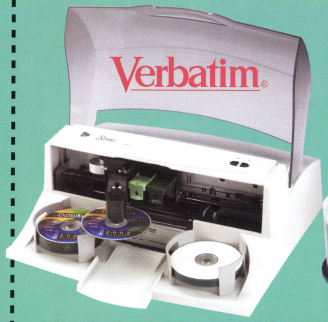
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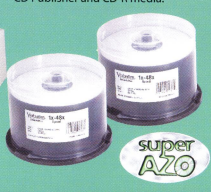
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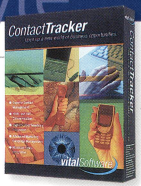
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First Byte

On track



Three new programs are going head-to-head in an effort to deliver CRM to small business. ACT Version 6 (**www.interact.com**) gains email, enhanced Outlook integration and document libraries. Legrand CRM 2.0 (**www.legrandsoftware.com.au**) also gets stronger Outlook hooks plus remote synchronisation. And the new ContactTracker (**www.vitalsoftware.com**) marks the return of the Melbourne-based team behind the original Tracker. Watch for reviews of all three in next month's *APC*.

Big things, small packages



Because of a new bridge between the USB 2.0 interface and ATA-100 disk drives spinning at 7200rpm, LaCie claims its d2 series portable hard drives deliver a sustained transfer rate up to 28MB/s over USB 2.0. Both the 80GB ($549) and 120GB ($725) drives have a 2MB buffer; the 200GB unit ($1,055) comes with a beefier 8MB.
www.lacie.com.au

Nice idea – woeful Wi-Fi



We were eager to try Nokia's D211 notebook PC combo card ($649), which allies cellular GPRS with local area Wi-Fi. But the lack of any voice functionality in the interface is a curious decision, and the card's performance over 802.11b was appallingly slow. It creaked along at 3.13Mbit/s and managed less (a pokey 2.66Mbit/s) over even shorter distances. Click your way to **apcmag.com** to read our review.
www.nokia.com.au

On the MuVo



Creative's Nomad MuVo is a tiny MP3/WMA player that doubles as a USB storage drive with 64MB ($299) or 128MB ($399) capacity. It's a nifty product if you can do without an LCD display for the playlist or audio controls, which have been left off to bring the price down to this very appealing level. Read the full review at **apcmag.com**.
www.australia.creative.com

Microsoft cuts more cables

The Big M's annual review of its keyboards and mice includes wireless models bristling with even more buttons and finished in classy colour schemes, all designed to bite into Logitech's dominance of the cordless market. Keyboards and mice that replace the conventional 27MHz wireless signals with Bluetooth are due any day now, while the long overdue Wi-Fi networking kits — introduced in the US in September — are expected to be here by mid-2003.
www.microsoft.com.au



See, hear

The newest additions to Logitech's ever-growing range of cool gear is a compact video camera for notebooks and an entry-level set of 5.1 digital speakers. The QuickCam Pro for Notebooks ($249) has manual focus with a close focus range of 15cm, and captures video at up to 640 x 480 or stills to 1,280 x 960. The Z-640 digital speaker system (also $249) features wall-mountable satellites rated at 50W RMS with inputs from TV and RCA stereo sources.
www.logitech.com

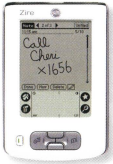


New Palms on hand

With the PocketPC eating into the handheld market, Palm has unveiled two new models (with names replacing model numbers) aimed at both ends of the spectrum.

The entry-level Zire (pictured) has a $229 price tag, 2MB of RAM and Palm OS 4.1 running on the classic (read "cheap and slow") 16MHz DragonBall EZ chip.

Powering the forthcoming Tungsten is Palm OS 5.0 and a 175MHz ARM-based processor with a 'double density' 320x320 pixel screen and multimedia support.
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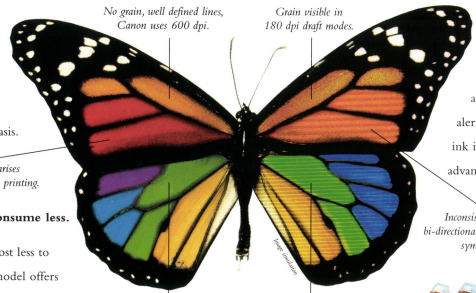
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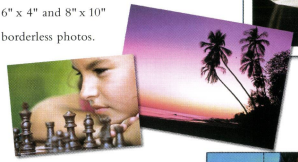
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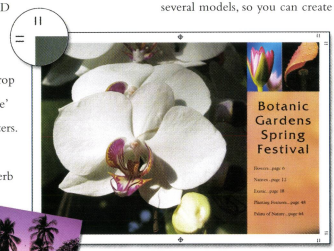
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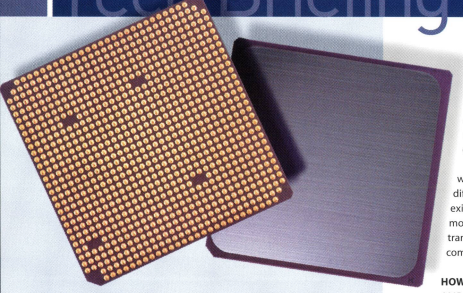
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2. Based on in house tests using ISO criteria. 3. Some features are not available on all machines. 4. S820D printer shown fitted with optional CV-100 LCD viewscreen sold separately. For more information please call Canon on 1800 021 167, or visit our website www.canon.com.au Specifications are subject to change without notice. Canon Australia Pty Ltd ABN 66 005 002 951. KCIPG 88513



Inside Opteron

How does AMD's next-gen CPU bridge the gap between 32-bit and 64-bit computing? *Matt Overington* explains.

64-bit processors are edging their way towards the middle of the radar screen, and with them comes the issue of managing the inevitable transition from 32-bit to 64-bit computing.

The main benefit of 64-bit architecture is that the processor can work with 64-bit chunks of data at once instead of 32-bit. But to enjoy this benefit, the 64-bit hardware must be partnered with a 64-bit software environment — from the operating system to the programming tools required to craft 64-bit applications (64-bit versions of Windows XP are already available, with a 64-bit edition of .NET Server due next year).

32- AND 64-BIT APPLICATIONS

Intel, IBM and Sun see two distinct markets for 32- and 64-bit applications, so their 64-bit powerplants employ a totally different foundation to the established x86 architecture. While current x86 chips are CISC-based (Complex Instruction Set Computer) processors, most 64-bit chips are RISC (Reduced Instruction Set Computer) processors and rely on a VLIW (Very Long Instruction Word) architecture — which is not backwards compatible and cannot run x86 code natively.

To run 32-bit applications on any of these 64-bit machines requires the code to be recompiled or to run in slower x86 emulation mode — which defeats much of the purpose of having a 64-bit machine in the first place.

AMD is also readying its entry into the 64-bit arena, but with a very different angle of attack. Rather than building a dedicated 64-bit architecture, AMD's Opteron family of processors extends the x86 spec to run in 64-bit mode. This allows the chip to run both 32-bit and 64-bit applications natively (even 16-bit apps!) instead of resorting to emulation.

This will improve performance and cost-effectiveness during the inevitable shift from the 32-bit to 64-bit world, especially on servers and high-end workstations, which are expected to be among the early adopters of 64-bit computing.

And as the Opteron is a CISC-based processor, 32-bit code won't need to be recompiled. Although, because of the minor differences between the x86 and x86-64 architectures, many existing 32-bit apps can be recompiled to 64-bit with minor modifications. This avoids maintaining support through the transition period when stepping between 32-bit and 64-bit computers.

HOW DOES IT WORK?

AMD has taken a leaf out of Intel's own playbook. In the same way that Intel added a series of 32-bit extensions to the existing 16-bit architecture to create the i386 chip, AMD's x86-64 architecture grafts a set of 64-bit extensions onto the current 32-bit platform.

The key to this is a new "long mode", which toggles access to the 64-bit processor extensions. When set false, the Opteron runs like a conventional 32-bit x86 processor which is no different to the chip inside your x86 desktop or notebook.

When the long mode global flag bit is set true, the Opteron can also run 64-bit applications natively. At the same time, it can run 32-bit and even 16-bit programs through a "compatibility bit". This is defined by flags which enable the processor to switch between standard 16- or 32-bit modes (if the long bit is set to off), or 16- or 32-bit compatibility modes, or full 64-bit native mode.

These flags are located in the Code Segment Descriptor (CSD), which is passed to the processor by the application on execution. In addition to containing information on the default compatibility mode, the CSD also holds details on the execution privilege level.

THE REX PREFIX

The most significant enhancement in the x86-64 architecture is the addition of the REX prefix to instructions. It adds eight GPRs (General Purpose Registers; ultra-fast 64-bit chunks of memory), and eight 128-bit Streaming SIMD Extension Registers (for a total to 16) when operating in 64-bit mode. There is also a new 64-bit Register Instruction Pointer (RIP) that is used to address data.

Because the processor is operating in 64-bit mode, all pointers and registers are operating on 64-bit blocks of data. If you are working with 32-bit applications and the data is stored in a 64-bit register, the unfilled register space is replaced with zeros. This means that compatibility with 16- and 32-bit applications can be achieved under a 64-bit OS in long mode.

The REX prefix also improves compiler register allocation by working with uniform byte, word, qword and dword registers. This is achieved by making the least significant byte of any GPR available for byte operations, which was previously not possible.

The proof of this 64-bit pudding will be in the testing. AMD has already released samples of Opteron to a close-knit circle of vendors and tech experts, with general availability due in the first quarter of 2003. ETTE



Read more about the next generation of CPUs in "Silicon Meltdown" on page 62.

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Microsoft hits the big screen

But, asks *Matt Overington,* is it playing second fiddle in the world of media services?

In an extravagant Hollywood-style launch in September— that had the assembled tech media double-checking they had the right invitation —*Titanic* director James Cameron, ex-Beatles producer Sir George Martin and rapper LL Cool J joined Bill Gates on stage to show off Windows Media 9.

Gates' keynote spoke of a future where millions of homes would be connected wirelessly, while residents electronically share music, videos and other forms of data. And this future would require a new vehicle to drive the distribution and uptake of streaming media services. It sounds a lot like the spiel RealNetworks gave with the release of its own streaming media service.

Bill says we need new video and audio codecs, improved encoding software and tools, a new server and player, and a revamped SDK. But he's also saying we need controls over how we use and distribute our own music and video.

Amid the fanfare and Microsoft flag-waving, many of the complaints of WM8 have still not been addressed. You still can't encode directly to MP3 without buying a third party codec, and you have to agree to a legal notice accepting all responsibility if you refuse to add copy protection to ripped tracks. Should you try and copy protected tracks to other machines, they will not play. So you can't copy music that you've ripped on your desktop machine and play it back on your laptop.

Oh come on Microsoft, I am more than capable of handling my own music files. For personal use, why not just use an open-source format like OGG?

Windows Media is going to be a vehicle for third party digital content servers to make money selling streamed content, using a similar model to RealNetworks. Already there are more than 60 partners providing Media 9 content, including on-demand movie and audio services. In short, the Windows Media format has matured and now includes more ways for people to make money by using it. Microsoft has learned from RealNetworks.

The presentation's location was well chosen, as Microsoft is actively targeting Hollywood with the latest release of its media family. Microsoft has spent four years and approximately half a billion US dollars developing Windows Media 9, which forms the cornerstone of Gates' plan to move the PC into an entertainment hub. Support for mid-stream advertisements has been added, along with on-the-fly playlists, and work on codecs that optimise performance for both voice and music streams.

Behind the copyright handling, both the audio and video codecs have been revamped and optimised between WM8 and WM9 to offer some compression enhancements. On average, *APC* has found that files encoded using Windows Media 9 are approximately 20% smaller than with Windows Media 8 — both for audio and video. Is saving a few megabytes of hard disk space worth sacrificing control over how you use your own music?

Rights management issues are not unique to Media Player, though. DivXNetworks has also announced that it intends to try and shed its bootlegging past by entering into the digital rights management market. In February, DivXNetworks signed an agreement with the Fraunhofer Institute for Computer Graphics to develop a digital watermark preventing piracy of DivX encoded media.

In the quest to prevent piracy, companies like Digimarc, Microsoft, RealNetworks and now DivXNetworks are sending the message that computer users cannot be trusted to manage their own data.

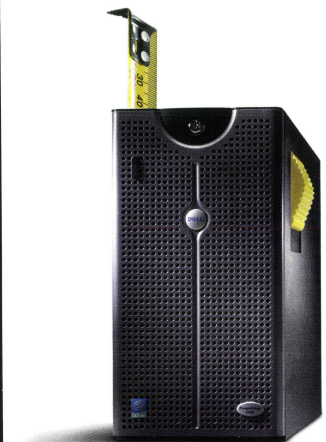
Is saving a few megabytes of hard disk space worth sacrificing control over how you use your own music?

RealNetworks has proven that the business model works. Already it has in excess of 700,000 paying subscribers for its exclusive streamed audio and live sports content. It has also announced that the upcoming versions of RealPlayer will feature support for Windows Media 9 files. On the other side of the fence, Microsoft doesn't plan on including free support for RealMedia files. RealNetworks has released a new version of its Helix server software at approximately the same time as Windows Media Server 9.

Helix streams Windows Media content that bypasses Microsoft's licensing scheme by reverse-engineering the Windows Media technology, and RealNetworks looks to be holding the trump card in the ongoing streaming media wars. At least the Windows Media 9 codecs are backwards compatible, so you don't need to stay on the cutting edge to benefit from codec improvements.

Soon, the older rights management-free versions of encoders for Windows Media, DivX and RealMedia could be in hot demand.

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Words: Garth Montgomery

Silicon meltdown

Can Moore's Law continue and take us into a new era of convergence, or have the limits of miniaturisation and speed already been reached?

As the IT industry across the board faces flat growth, experts are asking what technologies are on the horizon to pull the industry out of its slump. In days gone by, steady growth occurred as new technologies created new eras of computing and communication. The mainframe era delivered batch computing that was isolated from user interaction. It worked well and eventually led to massive growth in the form of the PC era, which enabled users to interact with intelligent systems and other people in a networked environment.

Now, say the experts, things are changing in the hardware industry. We're entering a new phase of product development that will usher in new components, software, devices and ways in which computing touches our lives. The IT industry is now collectively focused on converged devices that integrate the capabilities of computing and wireless communications infrastructure. And it's well beyond just PCs. Servers in multiple configurations, handheld devices, mobile phones and network processors are all being built around standard computing platforms.

Movement has been hotting up for all things wireless in recent months. From a global explosion in Wi-Fi hotspots at cafes; airports; hotels; offices and free community networks; war driving; and war chalking, wireless broadband providers are getting millions in venture capital at a time when IT is a dirty acronym.

The technology, desire, culture, and infrastructure are in nascent phases now, and product makers are madly developing to provide this groundswell movement with intelligent computing devices that serve a new era. It's an era that will see new kinds of devices, barely imagined today as researchers and developers come to grips with new materials and component designs that have the potential to change the very foundation of devices: the brains, the silicon and the chips that run devices that tap the networks that change the way we do things.

BEYOND MOORE'S LAW

At the core of all hardware development is the processor, and the chipmakers steering us into a new era of computing. Intel, AMD, IBM and HP universally acknowledge that they are on the edge of quantum changes in the design, capability and production of the central processing unit.

The convergence of communications and computing was a driving theme at September's Intel Developer Forum, held at San Jose's McEnery Convention Center. Four thousand developers from 38 countries descended on San Jose to paw over new R&D from the largest semiconductor company in the world. R&D that is the basis for developers' products that will shape the IT landscape in the near future.

For better or worse, Intel is the undisputed leader in sales volume. But more than that, it holds the one idea that alone drives development that ultimately affects all hardware, software, services and communications infrastructure: Moore's Law. This bold law states that chip capacity will double every two years. And it has stood the test of time since Intel co-founder Gordon Moore uttered it 30 years ago. It's a law that has defied the odds many, many times over, and relies on the microprocessor being cheaper to make while becoming increasingly available. Bill Gates wants "a PC on every desk, in every home". Intel wants "a processor in every device".

But Moore's is a law that is difficult to uphold. Researchers are now bumping into other laws that threaten Moore; scientific laws governing physics and chemistry have created an end in sight for Moore's Law under the current methodologies for building microprocessors.

Today we have 3GHz chips, a mind boggling milestone given that it took 19 years to reach 1GHz. Yet that achievement is totally taken for granted since it took only 18 months to double it to 2GHz in mid 2001. And still researchers are waving red flags saying: "No more, we can't go on."

The limit has been reached, unless dramatic change occurs at a material level of the processor. A new era in converged computing sounds great, but there's some serious work to be done.

The mantra at Intel for the convergence era is "all computers will communicate, and all communications devices will compute". Yet it won't happen while the bridge between this beckoning new era and Moore's Law remains broken.

Luckily the labs boffins have a plan.



MOORE IS WIDELY KNOWN FOR "MOORE'S LAW," IN WHICH HE PREDICTED THAT THE NUMBER OF TRANSISTORS THE INDUSTRY WOULD BE ABLE TO PLACE ON A COMPUTER CHIP WOULD DOUBLE EVERY COUPLE OF YEARS. IN 1995, HE UPDATED HIS PREDICTION TO ONCE EVERY TWO YEARS. WHILE ORIGINALLY INTENDED AS A RULE OF THUMB, IN 1965, IT HAS BECOME THE GUIDING PRINCIPLE FOR THE INDUSTRY TO DELIVER EVER-MORE-POWERFUL SEMICONDUCTOR CHIPS AT PROPORTIONATE DECREASES IN COST.

GORDON MOORE

Researchers at HP Labs have developed a new kind of circuit for computer chips . . . more than 1,000 of these could fit on the tip of a human hair.

EVERY APP ON EVERY DEVICE — OR... EVERYWHERE, ANYTIME

Convergence has been described as the Holy Grail of computing for 20 years. The communications industry arrived first, and it was built around analog technologies — huge exchanges and switching centres, acres in size. Then the first LANs using Ethernet technologies were deployed and the communications and computing industries started to get interested in each other.

This interest has accelerated as broadband capabilities allow highly visual digital data over networks. Devices and services from phones to handhelds to file sharing have forced the telecommunications infrastructure to standardise, driving mainstream adoption in the process.

If the next level of convergence is to achieve ubiquitous wireless, then new devices, new servers and modular building blocks for the telco infrastructure are required to ensure content can be stored and accessed anywhere. The challenge chipmakers face is to deliver converged silicon and platforms, along with development tools that make it quicker to develop product and also work in today's existing development environment. This is where the bunfight between competing platforms gets interesting.

There's no way to predict who will win in this emerging war. But essentially the same integrated development issues that arose from the client/server era will arise again in converged platforms and applications.

Chipmakers are now vying for developer attention with the proposition that they can develop once on one platform, and easily port it across multiple architectures to run on a range of devices. The SDKs for compiling, optimising and deploying apps from IA32 to PCA or IXA and other architectural environments will start appearing in 2003.

And just to prove that everything old is new again, developers are still implored by chipmakers to consider the specific device that their application will likely be used. It will still be a world where developers need to write multiple levels of applications that scale to different devices. Rich apps for the PC, limited-screen apps for PDAs, limited-capability apps for phones. But what will change most for applications developers is that all applications will need to be mobile. Meaning, applications will need to understand whether they are to be connected full-time or just occasionally.

NANOTECH: THINK SMALL

Ever robust, Moore's Law is finding new life in nanotechnology developments. These developments will introduce new materials and device structures that won't exactly sweep away the silicon technology base, but they will be introduced incrementally to replace parts of the current silicon technology base.

Intel broadly lumps all manufacturing efforts under the buzz word of nanotechnology. Nanotech is the science of building devices out of parts measuring 100 nanometres or less. One nanometer is one billionth of a metre, or about 1/1,000th the width of a human hair.

Today's chips are manufactured using a 0.13 micron process, which is 130 nanometres. If you want to understand how small that is, scientists say that human viruses are about 100 nanometres. Manufacturing below 100 nanometres is considered to be truly nanoscale and anything else is just pretending.

The next generation of process technology is 0.09 micron, or 90 nanometres. A smaller process technology means Intel can move to 300mm wafers exclusively. Today the 0.13 micron manufacturing process is split between 200mm and 300mm. Bigger wafers equals more chips produced for less.

The 90nm process employs strained silicon technology, which allows individual layers of silicon atoms to be spread apart lattice-style. When the silicon lattice is spread apart, electrons flowing between the transistors move faster. The faster the flow of current between transistors, the faster the chip performs to crunch complex tasks.

IBM researchers cite a 35% speed increase in chips that have electrons moving 70% faster in a silicon lattice made from the 90nm process. The first processor to be built using the new process will be Intel's Prescott, an updated design of the Pentium 4 microarchitecture.

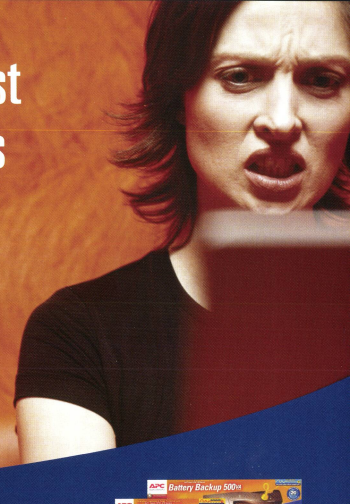
The new manufacturing approach plays alongside the convergence mantra perfectly. It will be applied to optical communications networking equipment to drive down the cost of high speed networks, wireless networking and smaller, cheaper phones that could be in the form of a simple earpiece. And these devices could conceivably roam between data networks from high-speed 802.11 to 3G.

However, a number of technological breakthroughs are required to make chips with smaller dimensions. Nanotechnology involves manipulating materials on the atomic scale, which requires a nano scale regime that starts to approach the dimensions of atoms. At this level, researchers rely on an increasing amount of atomic self-assembly which uses chemical properties to help form more ordered structures.

Chips made using today's 130 nanometer process contain transistors that are 70nm, which compare in size to complex living micro-organisms, such as viruses, which infect our bodies. But viruses cannot live and multiply on their own, the only way they can live and multiply is to invade much bigger complex living cells like the ones in our bodies. This same concept of self-assembly needs to be chemically replicated in the manufacturing process of computer chips.

"Crystal growth is a form of self-assembly, a very simple one, but imagine a molten vat of material, like silicon, for example," said Intel's vice-president of technology and manufacturing, Sunlin Chou. "It's a very disordered state. You put in a seed and you pull out a crystal. That's very ordered. That

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b) hand in her resignation letter?
c) get APC power protection?

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Power problems are the largest cause of data loss
Power disturbances are the largest single cause of data loss, accounting for 45.3 per cent of all problems. Source: Contingency Planning.

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"When we get things to silicon, everything gets cheap. When it gets cheap, it gets ubiquitous, it enables new markets, new capabilities."
Intel CTO, Pat Gelsinger

takes advantage of the natural tendency for atoms to order themselves in certain ways so it makes it easier to create structures."

But in order for device sizes to continue getting smaller, new process technologies are required. The current method for making the desired circuit functions on a chip uses lithography — an analog process that defines the lines and patterns on the chip wafer that will cause the circuit elements to be connected. But lithography faces a massive hurdle. To print very fine patterns on the wafer requires light that is at the wavelength equal or smaller than that of what you're trying to print. And the wavelength has not shrunk at the same rate as the feature sizes on the chip.

Researchers working on the next generation of chips are currently experimenting with alternative techniques called Extreme Ultraviolet Lithography (EUV). The light wavelengths used in EUV measure only 13nm compared with 193nm for today's lithographic techniques. The practical effect of EUV means that thinner circuit lines can be printed on chip wafers.

EUV was developed by private and government researchers at the Livermore and Sandia national laboratories. The main difference between an EUV tool and current photolithography machines is the wavelength of the light used to create the images of the circuit patterns. EUV allows chipmakers to use shorter wavelengths of light to create the images, which makes for smaller circuits.

Intel will use the first ever EUV beta manufacturing tool out of the factory in 2005. AMD, IBM, Infineon, Micron Technologies and Motorola are all members of the EUV LLC (**www.llnl.gov/str/Sween.html**), a consortium that pooled resources to jointly develop the technology with the US Government. Commercial production of chips using EUV should take place in about five years.

Chipmakers rate EUV as the technological breakthrough that will allow processor developments to continue shrinking at the pace of Moore's Law.

BEYOND 3GHZ? 3D TRANSISTORS

Problems loom large in the chip industry as it looks beyond 3GHz. For years, chipmakers have improved performance by adding transistors to their chips in keeping with Moore's Law. Transistors are microscopic on/off switches inside semiconductors and function as the basic building blocks of a processor. They route electronic signals that are eventually coordinated into higher-level commands.

Performance has doubled every two years because transistor numbers have doubled. In doing so, the industry has created an unintended set of problems. More transistors means more electricity can be pumped through at faster speeds. The heat produced by microprocessors — which can now contain over 200 million transistors — is becoming harder to dissipate. Also, the cost of designing and manufacturing these micro elements has skyrocketed.

The transistors that power today's CPUs are made on a flat layer of silicon called a plane, on top of which is a gate. Research shows that below 30 nanometres, the basic physics of the flat, single gate planar transistor leaks too much power to meet future performance goals of Moore's Law.

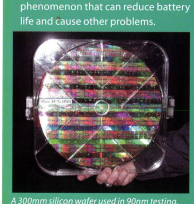
Intel R&D labs are now perfecting a three-dimensional transistor that will pile transistors above the silicon base. The new design employs a triple-gated transistor, which allows electronic signals to travel across the top and along both vertical sidewalls. Intel describes this process as being the equivalent of turning a one lane road into a three lane highway without making the chip any bigger and taking up space on processors that thrive on miniaturisation as a key selling point.

Essentially the tri-gate transistor enables the management of transistors within smaller places. The challenge in miniaturisation is maintaining an electronic current that doesn't leak. Leakages are currently dealt with by adding more power, which in turn generates unacceptable heat for the chip to function without unwanted sizzle.

Improvements at the device structure level of transistors are not the only part of chip development which is crucial to faster speeds in the near future. The 90 nanometre process also ushers in new interconnects at the back end of the chip wiring. Material changes in the chip started happening a couple of years ago when the wiring changed from aluminium to copper. Now the dielectric film

Nanotechnology

- Anything smaller than 100 nanometres is considered the breakpoint for nanoscale.
- The 90nm manufacturing process will use strained silicon, which is a new technique that will boost circuit performance by up to 20%.
- Intel's Prescott Pentium 4 processor debuts Q2 '03.
- Intel remains tight-lipped on how much faster Prescott will run using strained silicon, but analysts consider anything close to a double digit boost for the core frequency would be significant. Intel confirmed that the process would add 2% to the manufacturing cost.
- Chips made on this process will be more subject to gate leakage or random energy dissipation, a phenomenon that can reduce battery life and cause other problems.



A 300mm silicon wafer used in 90nm testing.

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between the metal wires is changing from silicon dioxide to materials that have a lower dielectric constant, because that allows the circuits to speed up.

Although the lower k dielectric materials speed up the circuits considerably, engineers are grappling with the challenges of putting these materials into production because they are mechanically weaker than the dielectrics currently used. And the challenge doesn't stop there. Once researchers can make these materials withstand a bit of wear and tear, they'll still need to be integrated and actually work with other components, such as the critical gate in a transistor.

For example, the 90 nanometer process relies on a thin insulating layer between transistors that is made of silicon dioxide. It measures only 1.2 nanometers thick — five atoms wide or 1/2000th the width of human hair. And the thinner the insulating layer, the stronger the transistor. Manufacturers like IBM have forged ahead with low-k dielectrics and Intel plans to play catch up in the next three to five years.

Low-k dielectrics or not, leakage comes back to haunt engineers. As insulating layers are made thinner and thinner, it starts to leak and fails as an insulator. The effect is that the transistor becomes inefficient and adds to power bills and cooling problems.

The leakages associated with silicon dioxide film have sent researchers worldwide on a search for new materials with lower leakage. Many exist. But the side effects usually degrade the current flow in the transistor.

Fortunately, nanotechnology opens up a huge range of options for chip materials that are currently under active research in universities. The two big contenders being considered for production next decade are nanotubes and nanowires.

A carbon nanotube is a tube that's only a few nanometers wide, and the wall of the tube is made of carbon atoms that have arranged themselves in a hexagonal manner — like a roll of chicken wire. It contains certain chemical and mechanical properties that control the variation of its conductivity depending on the axial twist of the tube. The tube itself can be adapted to be part of the actual transistor. The silicon nanowire is like a nanotube except that it's solid.

Researchers call these developments Intelligent Silicon, and expect it to be the foundation of new processes, materials and eventually devices that allow Moore's Law to jump the hurdle it faces today.

MOLECULAR PROCESSING

Meanwhile, in September, researchers at HP Labs bellowed that they'd developed a new kind of minute circuit for computer chips using nanotechnology. The researchers expect these new forms of molecular electronics to supercede silicon in advancing future computer technology. Measuring less than one square micron, HP scientists claimed that more than 1,000 of these circuits could fit on the tip of a human hair, extending the boundaries of conventional semiconductors, like silicon, to produce higher performance and greater capacity in CPUs and memory chips.

HP created the circuits using a new approach to molecular grids that resembles Intel's tri-gate transistors. The molecular grids lay out the features inside each circuit in an alternating north-south and east-west pattern, similar to a grid.

IBM also burst out of the lab in September, touting a double gate transistor. Scientists in IBM's Armonk, New York, facility revealed a working static RAM chip, which features two gates rather than the conventional one, for conducting electricity. In December, the company will provide details about the memory chip and discuss other research on transistors at its own technical conference. IBM has already made samples of Double Gate transistors, which it announced almost 12 moths ago, and they will probably start to appear in chips by 2006.

The emergence of multiple gates is seen as pivotal in the ongoing advancement of faster, more powerful chips. Gates

Hyperthreading - more is Moore

WHY?

For 10 years chipmakers have pushed processor performance by making the CPU execute as many instructions as possible in parallel. The technique is called instruction level parallelism (ILP) and both AMD and Intel concede that the engineering limits of ILP have been reached.

ILP relies on the link between the main memory and the CPU to push instructions through, and latency in this thin pipe has finally rendered ILP obsolete. Today's memory subsystems simply aren't as fast as they need to be to make ILP worthwhile.

Intel's temporary solution has been to add another thread at the CPU and claims efficiencies of 30-50% in passing instructions between the CPU and memory controller.

A THREAD?

A thread is like a batch of instructions that are sent to the CPU to be executed. If a CPU could receive two threads simultaneously, it could use applications simultaneously, such as running Microsoft Outlook while encoding a video to MPEG-4. This is what Intel's Hyper-Threading (HT) technology enables, and it begins shipping this month with the 3.06GHz Pentium 4.

KEY FACTS

- Allows a single CPU to act as two processors operating in parallel.
- Intel claims chips with HT will boost app performance by 25% over a processor on the same clock speed without HT.
- Developers don't have to rewrite apps for HT chips because the Pentium architecture remains the same, simply with another thread added to access the main memory.
- HT shows most promise for multi-tasking, especially with applications that have heavy input/output requirements (such as AV programs running in the background simultaneously with Web surfing activity).
- Begins shipping with the 3.06GHz Pentium 4.

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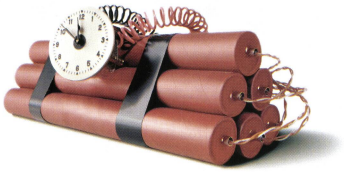
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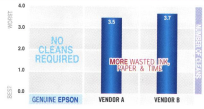
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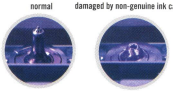
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2. Close up of actual ink feed needle which has been damaged from using a non-genuine ink cartridge.

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The sooner we digest this brave new era of converged technologies and products, the sooner we'll see its true colours as rancid refuse, or healthy compost fuelling the growth of IT.

function as conduits for electricity inside transistors. By adding gates, engineers can push more electricity through a transistor, thereby increasing chip performance. But don't expect double or triple the performance from chips sporting multiple gates. While Intel only thinks it can squeeze an additional 20% out of its tri-gate, IBM engineers were boasting of a 50% performance increase as a result of using double gates.

The lure of multiple gates for IBM lay in stemming the leakage of electricity from transistors. Leakage has become the primary inhibitor of chip development in the recent years as transistor gates and other chip components measure only a few atoms thick. By adding gates, engineers can lower the amount of electricity flowing through each gate to better manage any dissipation.

IBM engineers have slammed chips expected to come out next year using the 90nm process, claiming that about half the electricity will be lost through leakage. For notebooks, leakages mean poor battery life. In servers, it means bigger electricity bills as the server requires more energy and cooling systems because of the excess heat created from surplus electrical flow.

AMD is also on the double gate train, with its own brand of the twin-barrelled transistor based on the Fin Field Effect Transistor (Fin-Fet). Developed in conjunction with University of California and Semiconductor Research, Fin-Fet allows chipmakers to place as many as a billion transistors onto a chip area that today has 100 million transistors. More transistors equals more speed. Fin-Fet controls leakage with a thin, vertical silicon fin that blocks electrical currents when the transistor is in the off position. AMD expects chips built with these transistors to appear in systems in four to ten years.

SILICON RADIO: WI-FI MEETS CPU

Perhaps more than anyone, Intel CTO Pat Gelsinger is evangelising the dawn of a convergence era. At his IDF keynote speech he proclaimed: "As chips continue to get less expensive, more powerful and smaller, computers and wireless connections will be embedded in a range of products and services." Nothing new there, except Gelsinger was literally wearing the convergence era to demonstrate his point. He rode to the IDF stage by Segway scooter, decked head to toe with wireless gear, including a baseball cap with eye monitor and camera embedded, PDA, a Bluetooth headset, universal remote control and vest with a server sewn in the back.

"When we get things to silicon, everything gets cheap. When it gets cheap, it gets ubiquitous, it enables new markets, new capabilities," Gelsinger said. He went on to sketch a near future that would see Intel integrate radios on silicon by 2005. The result is free wireless communications for anything with a processor made from the 90 nanometre process, which will use expensive silicon germanium to create what Gelsinger calls a "communications platform".

But going forward, Intel's plans are to move away from pricey materials like silicon germanium and to build wireless into CMOS. The advantage of CMOS is that it's a widely used type of semiconductor that uses both NMOS (negative polarity) and PMOS (positive polarity) circuits. Since only one of the circuit types is on at any given time, CMOS chips require less power than chips using just one type of transistor.

This makes them ideal for use in battery-powered devices, such as notebooks and handhelds. PCs also contain a small amount of battery-powered CMOS memory to hold the date, time, and system setup parameters.

And it is already working in embryonic form. Gelsinger described a 5GHz transceiver in Intel research labs that has been built with 180 nanometre CMOS technology. Using standard CMOS technology, Intel researchers have been able to send and receive patterns at 5GHz from a microscopic dot in the centre of a 180nm chip. The next challenge is to bring analog components, such as power amplifiers and switches, in to CMOS silicon. Beyond that there are issues of making the antennae better, signal noise and line of sight problems, plus how to get effective use out of bandwidth where there is massive congestion. Gelsinger calls this "near future" research and Intel clearly has internal resources devoted to achieving half yearly milestones. Last IDF the company was discussing the theory of software-defined radios being able to dynamically reconfigure silicon radios. But he still wouldn't put a date on engineer samples, citing only "mid-decade" as a timeframe for when we'll see something. And when Intel insiders were asked about radio silicon, they greeted inquiring minds with a smirk and a shrug.

"Pat has a few pet projects. It'll be interesting to see if anything comes of it," said a product manager working with wireless devices at Intel.

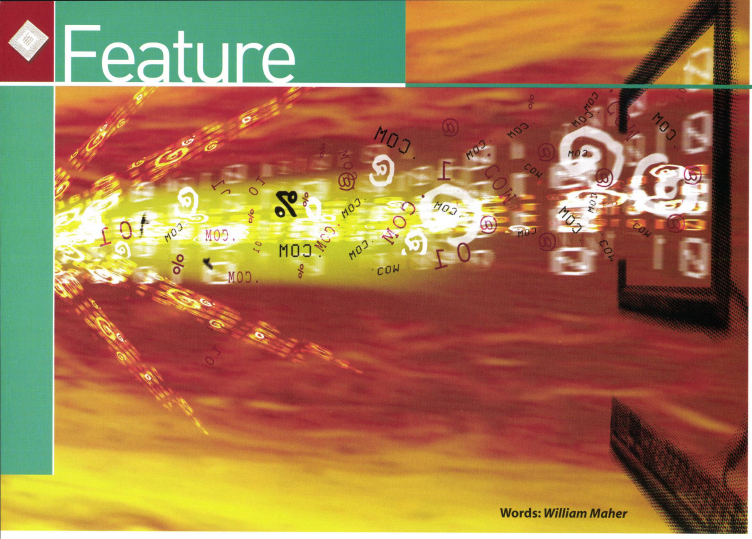
WHERE DOES THE FUTURE LIE?

So can Moore's Law continue and usher in a new era of convergence? Even Moore himself expects his law will slow down. When he received the Presidential Medal of Freedom last July, Moore reminded journalists that he's already revised the law twice — first in 1975 when he changed it from "chip capacity would double every year" to "every 18 months", then in 1995 he said it would "double every two years". Moore added that it could go to four or five years, especially when the limits of miniaturisation are reached.

Why? Computing and communications anywhere, anytime. It's a well-worn vision, laden with technical challenges for real world use, but it's slightly more significant today as it moves beyond a vision statement and starts to take shape in the form of architectures, platforms, product development, and telco infrastructure. All up, the building blocks for convergence.

These are the messages being driven hard by all vendors. And from what Intel demonstrated at IDF, the R&D teams are well funded to have the fruits of their labour integrated with commercial product cycle developments.

And the sooner we digest this brave new era of converged technologies and products, the sooner we'll see its true colours as either rancid refuse, or healthy compost fuelling the growth of IT. EDITC



Words: *William Maher*

More than just Megahertz?

Raw CPU speed may no longer be enough, as the GPU gains the ascendency.

Even as Intel unveils its latest chip, the campaign to take PC buyers' focus away from clock speed has stepped up a gear. Fuelled by a perceived slowdown in technology sales, AMD and others are arguing that it's time for a jaded public to rethink the need for speed.

With chipmakers finding it increasingly difficult to wring power out of smaller chips, speed freaks are instead spending their dollars on advanced new video card technology — complex cards like the GeForce 4, able to render forests in glorious sunlight; online 3D battlefields seething with real chaos; bump mapped images, high resolution textures, complex physics and dynamic lighting, full screen antialiasing, anisotropic filtering.

To render these types of graphics, oodles of raw CPU power are wasted — it's seriously specialised pixel power you need.

ATTENTION TO DETAIL

As games, DVD playback and video become more popular with PC owners, 3D technology is now emerging as an all-important factor in the PC's performance.

You could say that video cards are becoming like CPUs, with increasing numbers of transistors and more and more complex onboard instructions. Without the new breed of cards from ATI and nVidia — with specific instructions for processing shapes and adding textured surfaces to objects — games are dull and lifeless. Add a new card from these companies though, and trees spring to life with detailed leaves, while concrete-looking green ground becomes a carpet of grass.

Developers working in nVidia's next-generation graphics environment, including the CineFX architecture, will be able to write and compile much longer programs with hundreds of instructions — achieving near-cinematic results on a PC in real time. With the accelerated convergence of real-time and cinematic quality rendering, this will make myriad new special effects much more accessible.

nVidia boldly boasts that the move will "revolutionise" PC graphics. Analysts agree that video technology and gaming are largely driving the upgrade market. Clearly, graphics big gun nVidia is claiming a major role alongside the CPU — it has already combined a GeForce2 3D chip with a PC chipset, tagged the nForce.

"In 10 years, we should be bigger than Intel," a confident Nvidia CEO Jen-Hsun Huang told *Wired* Magazine earlier this year.

BEYOND THE CPU

With all the excitement, hard-core gamers, like

The CPU was king. Then it was suddenly Hey, you don't really need all those CPU cycles to achieve great things. Here, have a GPU!' The heavens opened!

Aussie Damian Wagner, don't baulk at spending a grand on a GeForce 4 card, almost double what he could have spent on a Pentium 2.2GHz chip. For many like Wagner, the 3D card *is* the most important piece of hardware in the computer.

"Up until I hit the 1GHz mark in the CPU area it was all about CPU, everyone wanted a fast CPU. The CPU was king," Wagner says. "Then it was suddenly, 'hey, you don't really need all those CPU cycles to achieve great things. Here, have a GPU!' The heavens opened!"

It's this sort of fervour that has PC retailers, like Ecom's Cam Rich, clamouring to have more PC owners look beyond CPU speeds. "If your graphics card can take overhead from the CPU, your system will run better," says Rich. Instead of suggesting customers fork out for a top of the line Pentium, he recommends they supplement a decent CPU with a new 3D chip.

The same view is being echoed by AMD, which argues customers are being duped by the so-called "Megahertz Myth" — that PC performance depends only on higher clock speeds. "True performance is more than just the processor. It's the chipset, the graphics card, even the frontside bus, to the speed of the hard drive. It's only going to get more complicated in the future," says AMD's consumer spokesperson Patrick Moorhead.

Instead of forking out for the latest Pentium, PC buyers are being encouraged to consider cheaper alternatives, or look beyond the CPU for performance. Moorhead says chipmakers are "hitting a wall" in terms of Gigahertz speed. As speed boosts get trickier, greater emphasis is being given to other parts of the PC.

AMD FIGHTS BACK

AMD is having yet another go at ditching the obsession with chip speed altogether. Like Apple, the chipmaker has fought for years to prove its technology in the face of flashier marketing and more impressive clock speeds from Intel.

Having last year renamed its chips with faster sounding model numbers, AMD is now trying to devise a new way of measuring chip performance. Under its own system the status quo is turned on its head — Intel is no longer the fastest chip on the block, and not surprisingly, AMD is the one with the benchmark crown.

"We talked about Sysmark, and Winstones and 3DMarks, and people didn't have a clue what that meant. When we took those third party benchmarks and put them into these categories and showed apps that made up benchmarks, people really understood," Moorhead explains.

Now, these AMD-friendly ratings measurements are being thrust at PC buyers and posted up in computer shops in a direct effort to counter Intel's never-ending onslaught of impressive-sounding chip speeds. Prizes and incentives are even being offered to encourage salespeople to convert customers to seeing things the AMD way.

AMD has B2B Web sites where salespeople are awarded prizes to come in and train. They visit, take a quiz, learn about the technology and get the chance to win something. In some cases becoming AMD-friendly can even earn salespeople a "special" deal on their own gear — a GeForce graphics card, a Gigabyte motherboard and Windows XP for a measly US$150.

Despite this dual attack by nVidia and AMD, the "Intel Inside" mantra still reigns supreme on the shop floor. In Australia, AMD holds more than 20% market share, but worldwide its stake has slipped to less than 20%.

nVidia has also been through a rough patch. In 2001, the company's shares were some of the best-performers on the S&P 500 index, but this year they have dived by 85%.

Retailers believe gaming is still a niche market. "All the general PC-buying public worry about is whether their PC can play basic games and has an Intel chip inside," says one Sydney retailer.

BUYERS GET CLUED-UP

Still, the pundits are confident that as gaming and entertainment increase in popularity, and as chipmakers find it increasingly tricky to wring power from CPUs, attention will shift away from CPU speed.

AMD's Moorhead claims that people are questioning why so much processor performance is needed. "Are people keeping pace with the technology? Are they even using the features that they have?"

Still, there's some evidence consumers are beginning to question the benefits of PC technology. In the US, a class action lawsuit has been ongoing, involving PC users who claim Intel misled consumers with performance claims in its advertising for the Pentium 4.

Sections of the PC market are also becoming increasingly tech savvy — it's what Moorhead and AMD depend on for continuing business. In Sydney, Moorhead recently pleaded to technology magazines: "If you can just get those darn 3GHz things off the front cover!" BITE

Speed breed

In recent years, nVidia has led the charge, but old foes are now taking the fight right to the market leader. For the first time in ages, the fastest consumer-level video card on the market isn't even from nVidia.

ATi holds the crown with cards powered by its Radeon 9700 chipset. The cards, released in September, have proven to be significantly faster than even the highest specced GeForce 4 Titanium, the 4600.

And while nVidia is promising its upcoming NV30 video hardware will account for ATi's upstart, there's another challenger in the wings. 3DLabs' P10 chip is promising to offer the next step in programmable video hardware — a tightly integrated GPU that works with the OS to a similar extent as the CPU.

Termed a Visual Processing Unit (VPU), the P10 chip seeks to usurp more functions from the CPU than ever before. More and more calculations that once were the sole domain of your AMD or Intel engine can now be farmed out to the chip.

The expected benefit? More complex calculations done faster.

Justin Kranzl

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Desktop PC megatest

Desktop PCs are busting out. They've got faster chips, more memory, bigger hard drives, better graphics and simply more bang-per-buck than ever before. But as always, there's good, bad and ugly to be found. We've tested 56 machines in all price/performance ranges — from budget, to balanced, to burners. So if you're in the market for a new desktop this Christmas, you'll probably find it here.

76 **Below $1,500**
Money right? We evaluate 11 budget-beaters that even your bank manager would approve of.

86 **$1,500–$2,499**
14 desktops jostle for your attention in the happy medium category between cost and clobber.

98 **$2500–$3499**
In this ever-popular spot we tested 15 machines — some very sweet, some quite soul.

110 **$3500–$4999**
Intensive data crunching or conspicuous consumption? A neat dozen rigs strut their stuff.

120 **Above $5000**
Go for broke, literally, with four behemoths that push the limits on benchmarks and your credit card.







Words:
David Lin
Ben Menge
Matt Overington
Ashok Zaman

Below $1,500 systems

Need a new system on a tight budget? Fear not, for $1,500 or even less you can snag yourself a smart machine to get you going.

APC was pleasantly surprised with the overall quality of the systems supplied to this megatest in the sub $1,500 category. One of the standout features in this group was the quality of core components that made up the systems. In particular, the widespread use of the powerful Athlon XP up to the 2000+, a chip normally reserved for machines of a higher pedigree.

Nonetheless, the Athlon XP makes an excellent budget solution, giving an edge over the systems using the AMD Duron or the Intel Celeron budget CPUs. Ecom even managed to sneak a Pentium 4 2GHz into its budget offering, showing that processing power is not exclusive to premium systems.

Most of the machines sport a reasonable 256MB PC2100 DDR, though the Home Pro 3020 provides a healthy 384MB, while Altech packed its Viper XP machine with 256MB of faster PC2700 DDR RAM.

Graphically, most of the systems did not disappoint, with GeForce4 MX cards, or even the odd GeForce4 Ti4200. Even though the sub-$1,500 systems are trim on features — offering just a single optical drive, or using the integrated sound controller on the motherboard — most will form an excellent foundation from which to add new peripherals and devices, or as the need to upgrade arises.

Altech
Viper XP

Plenty of grunt offset by some nice peripherals give the Altech Viper XP the winning combination.



The bare-bones nature of the sub-$1,500 category can often mean impotent PCs with corners cut, cheap peripherals and poor components. Not so with the Altech Viper XP.

Altech has opted to fit the Viper XP with an Athlon XP 2000+, offering top value for money per megahertz of grunt, coupling it with a standard 256MB PC2700 DDR RAM. Selecting the X-Micro GeForce4 MX440 is again a wise budget option; this cut-down version of the GeForce4 with 64MB video RAM provides very satisfactory graphic power at a fraction of the cost of a top-range card.

apc EDITOR'S CHOICE NOV 2002

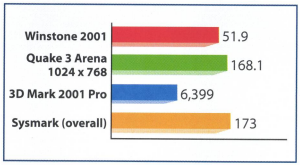
Accordingly, 51.9 in Business Winstone 2001 and 6,399 in 3DMark for the Viper XP — while by no means outstanding — indicates very competent performance in both the office and gaming roles.

Presented in a basic midi tower case, the Viper XP is constructed tidily with plenty of open space and five of six PCI slots spare on the Soltek SL-75DRV5 motherboard for future expansion.

A network card handily occupies the one slot in use, making the Viper XP very suitable for a network-client role. Altech provides ample storage space in the 40GB ATA100 Seagate Barracuda IV, though the manufacturer has opted to include only one optical drive in the LiteOn 40x/12x/32x CD-RW to meet price constraints.

Similarly, the Samtron 17in shadowmask screen strays toward the ordinary. Thankfully, Altech saw fit to include respectable input devices in the Microsoft PS/2 Internet keyboard and mouse, along with reasonable 2.1 Creative Inspire 2400 speakers.

This cleverly avoids sub-standard peripherals, which are among the glaring hallmarks of a cheap PC.



Details >>

CPU AMD Athlon XP 2000+
RAM 256MB PC2700 DDR
Graphics card GeForce4 MX440
Hard disk 40GB Seagate Barracuda IV
CD/DVD 32x/12x/40x Lite-On CDRW
Audio Onboard AC'97
Speakers Creative Inspire 2400
Monitor Samtron 76E
OS Windows XP Home
Contact Altech Computers
Phone (02) 9735 5655
Online www.altech.com.au
Price $1,495

Verdict >>

Performance
Bang/buck
Features

Overall



Australia IT AIT
S2 Series

Dull and noisy: words that adequately describe the Australian IT AIT S2. The disappointment continues with only average performance, but you get what you pay for. All criticisms aside, at $1,499 it does provide decent value.

The Mitsumi FX54++W CD-ROM sounds like an aircraft taking off, and practically makes the whole system shake. The internal CPU fan can also be easily heard, and seems to be amplified within the almost empty case.

The case is typical of what you would expect of a cheap, clone PC — very bland with no distinguishing features. Three screws need to be removed for entry. Inside there's plenty of room to grow, with two free 5.25in bays, one free 3.5in bay and four free PCI slots on the Asus A7S333 motherboard.

For the price, however, the AIT S2 gives above-average performance, but the GeForce3-powered Sparkle TI200 video card can't match its GeForce4 big brothers, reflected in the 3DMark score of 6,606.

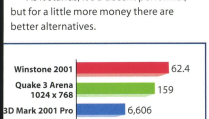
The Business Winstone score of 62.4 shows that the system is more than capable of running most applications, though an extra 256MB of DDR RAM would do wonders for this machine.

Power users probably won't look twice at the AIT S2, but if you're after a second system, or if your budget only allows for a starting system — which can be expanded as finances allow — the Australia IT AIT S2 could be the system for you.

As it stands, it's a decent performer, but for a little more money there are better alternatives.

Details >>

CPU AMD Athlon XP 2000+
RAM 256MB DDR
Graphics card Sparkle TI200
Hard disk IBM IC365L040AVVA07 40GB
CD/DVD Mitsumi FX54++W 54x
Audio C-Media CMI8738
Speakers Juster 3D-501
Monitor Samsung 753S 17in
OS Windows XP Home
Contact Australia IT
Phone (03) 9543 5855
Online www.australiait.com.au
Price $1,499



Verdict >>

Performance
Bang/buck
Features
Overall



CWS
Home Pro 3020

The HomePro from CWS lacks nothing for the casual gamer, Internet, email user or student, all at a pocket-friendly price.

The Gigabyte GA-7DXE is a no-frills motherboard and comes loaded with an AMD Duron running at 1.3GHz. The board offers an upgrade path if you want to go for an Athlon of 2GHz+ (providing you decide on that upgrade before AMD redesigns its CPU pin outs).

A modem and an Ethernet card, accommodating both broadband and dialup, populate two of the PCI slots. In the AGP slot resides an Eagle video card of GeForce4 MX460 persuasion, which ran Quake 3 quite happily at 132fps in 1,024 x 768 mode and scored 4,801 in 3D Mark.

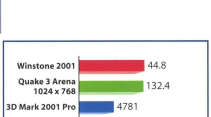
The MX range of nVidia-based cards are always considered to be the short-legged cousins of the mighty Ti4600's, but, at around one-sixth of the price, they prove themselves more than competent when it comes to everyday operations.

The DKL "high quality" speakers definitely aren't, but it's an understandable compromise when keeping the overall price down. The 40GB Barracuda drive is the smallest you'll find in a PC these days and will be hard-pressed to gratify today's insatiable software.

Ardent Morpheus and iMesh jockeys take note! A BenQ CD-RW is a welcome sight in such a cheap and cheerful machine — it has become one of the most essential parts of the PC since the invention of files larger than 1.44MB, and is something that shouldn't be omitted from this type of computer.

Details >>

CPU AMD Duron 1.3GHz
RAM 384MB PC2100 DDR
Graphics card Eagle GeForce4 MX460 128Mb
Hard disk Seagate Barracuda IV 40GB
CD/DVD BenQ 48x/12x/40x CD-RW
Audio Onboard AC97
Speakers DKL 5P-698 Multimedia
Monitor Viewsonic E70 17in CRT
OS Windows XP Home
Contact CWS
Phone (02) 9519 2888
Online www.cwsydney.com.au
Price $1,499



Verdict >>

Performance
Bang/buck
Features
Overall



Ecom
SOHO 4200

The Ecom SOHO 4200 avoids the look and feel of a cheap PC, despite residing in this price category. The case is relatively standard and features the same style fascia with a silver-chrome finish that adorns many of the PCs in this megatest.

Unusual for a value offering is the inclusion of the excellent Microsoft Natural Internet keyboard, which includes two USB ports at the back, making a total of four front-facing USB ports (if you include the two ports mounted on the fascia of the SOHO 4200). Ecom also includes a Microsoft Optical mouse.

At the centre of the PC is the Gigabyte GA-81E motherboard, based on the i845E chipset. It hosts a Pentium 4 2.0GHz CPU and 256MB PC2100 DDR RAM and the ultra-budget GeForce2 MX400 graphics card. Unfortunately, application benchmarks failed to run on the SOHO 4200.

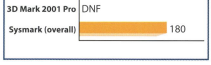
This is through no fault of the machine itself, but just one of those rare occasions that a benchmark will not run.

Given the specs, you can expect the performance to be average, though adequate for its class. Quake 3 results of 65 fps in the 1,024 x 768 pixel resolution gives a good indication of 3D performance, and the standing of the machine overall.

It's simply configured with a 40GB Seagate ATA100 hard drive, and a 56x CD-ROM, and average LG 15in montior. Ecom has also equipped the SOHO 4200 with a PCI 56K modem and connected two extra USB 2.0 ports to the bottom backplate, completing a tidy budget PC.

Details >>

CPU Intel Pentium 4 2.0GHz
RAM 256MB PC2100 DDR
Graphics card Leadtek Winfast GeForce2 MX400
Hard disk 40GB Seagate U series
CD/DVD 52x CD-ROM
Audio Realtek ALC650 5.1
Speakers None
Monitor LG 563N 15in CRT
OS Windows XP Home
Contact Ecom Computers
Phone 1300 369 838
Online www.ecomcomputers.com.au
Price $1,499



Verdict >>

Performance
Bang/buck
Features
Overall



Emagen
Essentia XP 1800+

From the basic specification to performance and the lack of expandability, this is a system hard to recommend unless space is at such a premium that you want to sacrifice value for this pint-sized box.

The GeForce4 MX420 video card was only able to achieve an ordinary 3DMark score of 3,878. Match this to the Samtron 76E monitor and it's all pretty depressing. While the display is certainly viewable, colours were not vibrant (especially red). Additionally, the display wasn't exactly square.

The Lite-On LTR-40125S CD-RW is very noisy, and sometimes sounds like it's actually grinding CDs instead of spinning them.

Respectable scores were achieved for the Maxtor Viper 6L040L2 hard drive. A High-End Disk WinMark score of 15,500 shows at least one component in the system performs okay.

The Mitsubishi keyboard is quite good also, with positive feedback and a quality feel to it.

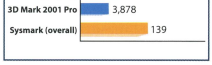
Other benchmark scores showed that the Essentia XP 1800+ would suffice for basic office functions, but not beyond that.

The lack of included speakers may be a hint as to its target market as well. Expandability options are practically non-existent as all internal real estate is already occupied, except for two free PCI slots on the Gigabyte GA-7KVMP motherboard.

At $1,499 it won't take long to find a better specified and stronger performing system which will offer much more in the long term.

Details >>

CPU AMD Athlon XP 1800+
RAM 256MB PC2100 DDR
Graphics card GeForce 4 MX 420 64MB
Hard disk 40GB Maxtor Viper D740x
CD/DVD 40x/12x/48x Lite-On CD-RW
Audio Onboard AC'97
Speakers None
Monitor Samtron 76E
OS Windows XP Home
Contact Emagen
Phone 1300 880 070
Online www.emagen.com.au
Price $1,499



Verdict >>

Performance
Bang/buck
Features
Overall



Marvel Endeavour 2000

When it comes to good performance on a budget, the AMD Athlon is hard to beat. Marvel has chosen this wallet-friendly piece of silicon to create the Endeavour 2000 — it certainly hits the spot.

And cheap doesn't have to mean slow. The Athlon XP 2000+ sits on a GA-7VRX main board with Gigabyte's Dual BIOS and VIA KT333 chipset. It's good to see Gigabyte, as well as many other manufacturers, conceding that enthusiasts are going to try to squeeze a few extra megahertz out of their system.

This is borne out by the inclusion of its EasyTune over-clocking utility. With budget price comes lower spec parts, and the video card is one area many hundreds of dollars can be axed. Still, the Winfast GeForce4 MX440 does a good job at graphical tasks — as the 3DMark score of 5,900+ testifies.

Quake 3 is highly graphics-intensive and at 1,024 x 768 we managed to frag the beasts at 157fps. Sysmark tests gave a respectable final score of 174.

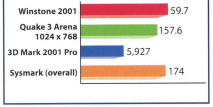
The Seagate hard disk seems small at 40GB, but it would be adequate for the penny-watching SOHO user. 256MB of RAM comes as standard in one slot, leaving two slots free for up to 3GB of DDR.

A PCI modem is there for dialup Internet but broadband subscribers will have to add their own Ethernet card or go USB. Two USB 1.1 ports grace the front panel while two USB 2.0s can be found in the rear.

The Diamond View 17in monitor is a quality unit, capable of a crisp 1,280 x 1,024, albeit at only 60Hz.

Details >>

CPU AMD Athlon XP 2000+
RAM 256MB PC2100 DDR
Graphics card Leadtek Winfast GeForce4 MX440 64MB
Hard disk 40GB Seagate Barracuda IV
CD/DVD Sony 52x CD-ROM
Audio Onboard AC97
Speakers Rock 3-piece speaker system
Monitor Mitsubishi Diamond View 1770H 17in CRT
OS Windows XP Home
Contact Marvel Computers
Phone (02) 9680 9688
Online www.marvelcomputers.com.au
Price $1,499



Verdict >>

Performance
Bang/buck
Features
Overall

Wise Investments

A guide to giving your system a timely boost without breaking the bank.

Some systems submitted for this month's PC megatest were well under the maximum price limit for their category. One example was the $1,149-priced system from Also Technology (in the sub-$1,500 class).

There was plenty of money left over to add an extra 256MB of RAM, up-spec the monitor and still come in under the price ceiling. The price of components at the moment means that you can garner some excellent deals on hardware to upgrade your PC.

MEMORY

Nothing recharges a tired, aging computer's batteries like a dose of extra RAM. A 256MB stick of PC2100 DDR-SDRAM will set you back around $130 (or around $180 for PC2700) and generally keep the upgrade demons at bay for an extra six months.

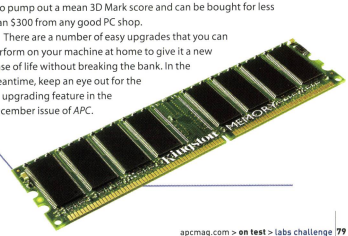
If you're locked into a motherboard that uses PC133 SDRAM, you may consider switching to a DDR-compatible motherboard and adding RAM to suit. Always try and buy the most RAM you can afford: some of the staff at *APC* run over a gigabyte on their home machines.

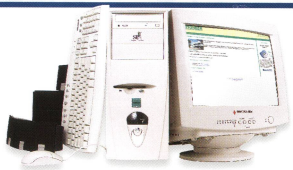
GRAPHICS CARDS

The same basic rule holds true for graphics cards. Because of the rapid developments in video card technology, graphics subsystems have traditionally aged quickly. GeForce4s and ATI Radeons are dropping into the realms of affordability for mainstream buyers and not just the gaming elite.

Most of the systems in the lower price categories came stocked with GeForce4 Ti4200s; an awesome card that'll raise the 3D performance of any AGP4x-equipped machine. A Radeon 8500 will also pump out a mean 3D Mark score and can be bought for less than $300 from any good PC shop.

There are a number of easy upgrades that you can perform on your machine at home to give it a new lease of life without breaking the bank. In the meantime, keep an eye out for the PC upgrading feature in the December issue of *APC*.





Pioneer
VALUE PC

Pioneer has chosen the new Intel 1.8GHz Celeron to power the VALUE PC, which is a cut-down budget version of the Pentium 4, running on 400MHz bus and 128K Level 2 (L2) cache, unlike the Northwood Pentium4s with a large 512K L2 cache, and up to 533MHz bus.

The advantages are low cost, and compatibility with all socket 478 Northwood Pentium 4 motherboards. The disadvantage is that the small L2 cache kneecaps the Celeron's performance.

Running with 256MB PC2100 DDR and a quick GeForce4 Ti4200, it turned in a lowly 35.9 in Business Winstone — slow against the competition but adequate for general office tasks nonetheless. 3D fared a little better, thanks to the graphics card, with 6,790 3DMarks and 135.7 fps in Quake at 1,024 x 768.

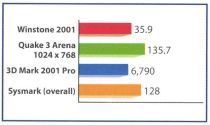
Seated in a micro-ATX form factor Gigabyte GA-8IRM, the VALUE PC only offers three PCI slots for expansion, and comes without LAN or modem connections, but it does come with a basic AC'97 sound controller. Media is handled by a simple 56x CD-ROM, with a small 20GB hard drive to accompany it.

The VALUE PC uses the same cheap Superpower case as the SOHO and POWER systems. Unlike the SOHO PC, however, it arrived with the side panel fastened in place and everything in order.

15in CRTs are unexciting at best, but the Diamond View is a reasonable choice. While the keyboard is solid, Pioneer could do better than a two-button scroll-less mouse. Overall, this system is a pretty tight budget offering.

Details >>

CPU Intel Celeron 1.8GHz
RAM 256MB PC2100 DDR
Graphics card Creative 3D Blaster GeForce4 Ti4200 64MB
Hard disk 20GB IBM Deskstar
CD/DVD Mitsubishi 52x CD-ROM
Audio Onboard Realtek ALC201A
Speakers 180W desktop speakers
Monitor Mitsubishi Diamond View 1554R 15in CRT
OS Windows XP Home
Contact Pioneer Computers
Phone (02) 9690 2888
Online www.pioneercomputers.com.au
Price $1,499



Verdict >>

Performance
Bang/buck
Featutres
Overall



Plus Corp
Aspect T1

The Aspect T1 by Plus Corp is a good choice for the home user requiring a no-frills, straight-up computing solution.

When aiming a product at such an entry-level price, you have to expect some trade-offs in the standard of components. The T1's onboard GeForce2 video adaptor, for example, is unexciting when it comes to 3D graphics performance. It came in at a shocking 3DMark of 1,795 and a Quake 3 frame-rate of 41fps at 1,024 x 768 with 32-bit colour.

However, this is not meant to be an earth-shaking games console, but a basic machine giving the user access to word processing and Internet. The MSI K7N420 motherboard has the nVidia nForce 420D chipset and supports AGP 4x, allowing a graphics upgrade later.

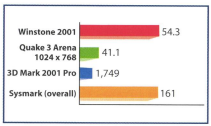
There's a 10/100 Ethernet port too, for hassle-free network or broadband connectivity. It also supports up to four drives on the dual ATA100 IDE channels and comes hooked up to a 40GB Barracuda as standard. A PCI modem is standard equipment in the T1, as are no less than six USB 1.1 ports.

Sadly, no USB 2.0 is included, but can be added with a PCI adaptor. A pair of Altec Lansing stereo speakers comes in the package and if you want surround sound there's a SPDIF jack on the back panel for connection to an external digital decoder. The interior of the case is very tidy.

A noticeable omissions fans for airflow, as even this low-end machine gets fairly toasty inside. And while a DVD-ROM is handy for watching movies, a CD writer would have been an inexpensive and more valuable alternative for the average user.

Details >>

CPU AMD Athlon XP 1900+
RAM 256MB PC2100 DDR
Graphics card Integrated onboard video
Hard disk 40GB Seagate Barracuda IV
CD/DVD 16x DVD ROM
Audio On board AC'97
Speakers Altec Lansing AVS 200 stereo speakers
Monitor Samsung 753S 17in
OS Windows XP Home
Contact Plus Corporation
Phone 1800 007 587
Online www.pluscorp.com.au
Price $1,495



Verdict >>

Performance
Bang/buck
Features
Overall

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Driving the New PC Era

COMDEX

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AMD Athlon PROCESSOR XP

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Source Technology
Economy PC

This budget system from Source Technology is housed in the same steel chassis as the premium machine — a heavy-duty desktop case with an old-fashioned look. Without the monitor it could pass for the same system, except for the single CD-ROM drive in place of the dual optical drives.

The cost-cutting Source Technology used to formulate this model is evident: a 15in Mitsubishi monitor and a wheel-less Microsoft mouse. The powered speakers are a simple pair capable of giving you those pops and beeps in stereo and little else.

The modest monitor is driven by a GeForce2 MX400 card, a budget component that's heyday was about 18 months ago. It generated a 3DMark 2001 score of 1,429 which is on a par for this type of system. OpenGL testing with Quake Arena fared poorly also, with a frame rate of 19.7fps at 1,024 x 768 resolution.

Inside the case there's no flamboyance as Source has put together a PC according to the basic Intel standard. It's powered by a Celeron 1.8GHz, a weakling compared to the latest Pentium 4s.

The choice of motherboard is a tiny flex ATX board from Intel that is too small for the case. There are three PCI slots on the board and the case allows for an extra three redundant expansion slots — a poor use of resources.

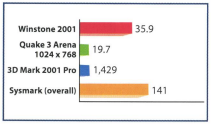
Any sub-$1,500 PC is a bundle of compromises and those made in the Source Value PC are keenly felt through the benchmarks. However, speed is not what this system is about and its stability and solidity would fit it into a student or corporate environment.

Details >>

CPU Intel Celeron 1.8GHz
RAM 256MB PC2100 DDR
Graphics card Pine GeForce2 MX400 128MB
Hard disk 40GB IBM Deskstar 60GXP
CD/DVD 52x Sony CD-ROM
Audio On board AC97
Speakers Media Station
Monitor Mitsubishi Diamond View 1554R
OS Windows XP Home
Contact Source Technology
Phone (03) 9467 1966
Online www.sourcetechnology.com.au
Price $1,480

Verdict >>

Performance
Bang/buck
Features
Overall



Briter
Business System

Briter Computers has incorporated a 1.7GHz Celeron into this machine and come up with a very affordable system that's more than capable of tackling everyday office duties.

Aesthetically the Business System is bland, and an internal inspection revealed uninspiring build quality. The cabling is just not as tidy as some other contenders, however, the component level is respectable. The Gigabyte GA-8IE motherboard — which can carry the latest P4 with up to 533MHz FSB — plays host to an AGP Gigabyte Radeon 7500 video card, as well as a Swann PCI modem and Realtek Ethernet card.

A 40GB Seagate Barracuda ATA IV hard drive spinning along at 7,200rpm and a stick of 256MB DDR RAM are both perfectly suited to office applications. Unfortunately, the hard drive is mounted in a poorly ventilated portion of the case.

The fascia panel sports miniscule one-inch front-mounted stereo speakers, which sound little better than an internal one. The "3D" button is laughable for driver cones that are only 10cm apart. A low-cost pair of stereo speakers would have been a more worthwhile inclusion.

It's good, however, to see a dedicated Radeon 7500 Pro video card installed rather than using a lower spec onboard video controller.

This contributed to the decent 3DMark score of 3,800, without skyrocketing the price. A CD writer could also have been included at little extra cost.

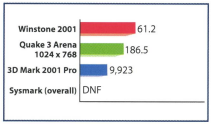
These days it's seen as standard equipment and it's a shame this Business System had to miss out.

Details >>

CPU Intel Celeron 1.7GHz
RAM 256MB PC2100 DDR
Graphics card Gigabyte GA-AR64S-H Radeon 7500 Pro
Hard disk 40GB Seagate Barracuda IV
CD/DVD 52x CD-ROM
Audio On board AC97
Speakers Built-in
Monitor Hyundai V770 17" CRT
OS Windows XP Home
Contact Briter Computers
Phone (03) 5940 1698
Online www.briter.biz
Price $1,450

Verdict >>

Performance
Bang/buck
Features
Overall



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- Flexible Serial ATA and ATA133 connectors (optional)
- RAID 0 or RAID 1 Supports(optional)
- BroadCom 10/100 Mbps or 1000 Mbps Ethernet controller(optional)
- 2 x 1394 ports (optional)
- InterVideo WinCinema bundled (Gold version only)





- Support Intel® Pentium® 4 /Celeron 533/400MHz FSB Processors
- Intel® 845GE Chipset
- Intel® Hyper-Threading Technology ready
- 3 x DDR333 supports max. 2 GB memory
- ADI 6-channel 3D Audio(optional)
- Integrates 3D Graphics
- BroadCom 10/100 Mbps Ethernet controller(optional)

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Which budget CPU?

Celeron, Duron, Athlon — what's the difference between these budget CPUs?



While most attention is focused on the upper echelons of the CPU race, it's at the budget end of the scale where the most hard fought battles are waged for your money. Chip manufacturers Intel and AMD have obliged by segmenting their processor range to offer low-cost CPUs suitable for the cut-throat high volume, low margin budget PC markets.

2GHZ CELERON

Intel's latest incarnation of the Celeron processor line is the 2GHz Celeron, based on the Willamette core. It's the first Celeron manufactured on a 0.13-micron process and comes packaged with the same FC-PGA2 478-pin form factor as the latest Northwood Pentium 4 processors.

One of the best advantages of this is that it allows widespread compatibility with the chipsets that support the 478-pin Pentium 4s, and the opportunity to upgrade to a Pentium 4 in the future. Like the Willamette, it runs on a 400MHz quad-pumped bus, but its Level 2 (L2) cache has been halved to 128KB, which impacts the performance of the Celeron significantly compared to its Pentium 4 sibling.

AMD DURON

AMD's Duron processor has long had the edge over the Celeron, both in terms of price and performance, for a long time making it the obvious budget CPU choice. The Morgan core 1.3GHz Duron is a derivative of the Athlon XP chip, again with a smaller 64KB L2 cache, and the smaller 128KB L1 cache, and will also conveniently run on Athlon-based motherboards.

The performance hit is a lot less dramatic than in the Celeron, due to differences in architecture, making the Duron a very cheap CPU with plenty of guts. However, it has not progressed beyond 1.3GHz since its release early this year.

ATHLON XP

Surprisingly, the Athlon XP has defied market segmentation, competing against both the Celeron and AMD's own Duron as a value CPU of choice, something that you can clearly see in the sub-$1,500 class in this megatest.

Also Technology
Vogue Essentia I300

This PC looks like a promising system for beginners. Fitting into a flex ATX form factor, it can be used in an upright or reclined desktop position. It's powered by a Duron 1300 CPU, which does surprisingly well in real life use, DVD viewing for example, although the benchmarks show it's a plodder.

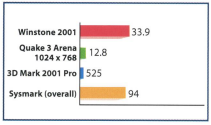
The most impressive part is the combo Panasonic DVD-ROM/CD-RW drive. One optical drive covers every eventuality (except burning DVDs) and judging by the wrangling over rewritable DVD standards, you're not missing out.

The monitor is a 17in Ultraview and it performed appallingly. It displayed serious artefacts during benchmarking and even in idle time. The display adaptor was not to blame because as soon as we swapped monitors, the problems disappeared. Maximum resolution was confined to 1,024 x 768 at 60Hz, which would have made the grade circa 1995 but doesn't cut it these days.

Inside the case is a tidy interior without the loose fans that marred the other machines from Also Technology. The Microstar MS-6390 motherboard is a highly integrated board based on the VIA KM266 chipset, and takes care of sound, networking and the graphics through an onboard S3 video chip.

Understandably this PC did not fare well in benchmarking. A Business Winstone of 33.9 and overall Sysmark of 94 are just two results that tell the performance story.

This is a handy, budget machine. Don't be put off by the slow benchmarking results; if speed is not a concern and all you need it for is office productivity tasks like word processing and the occasional DVD, it's a good investment.

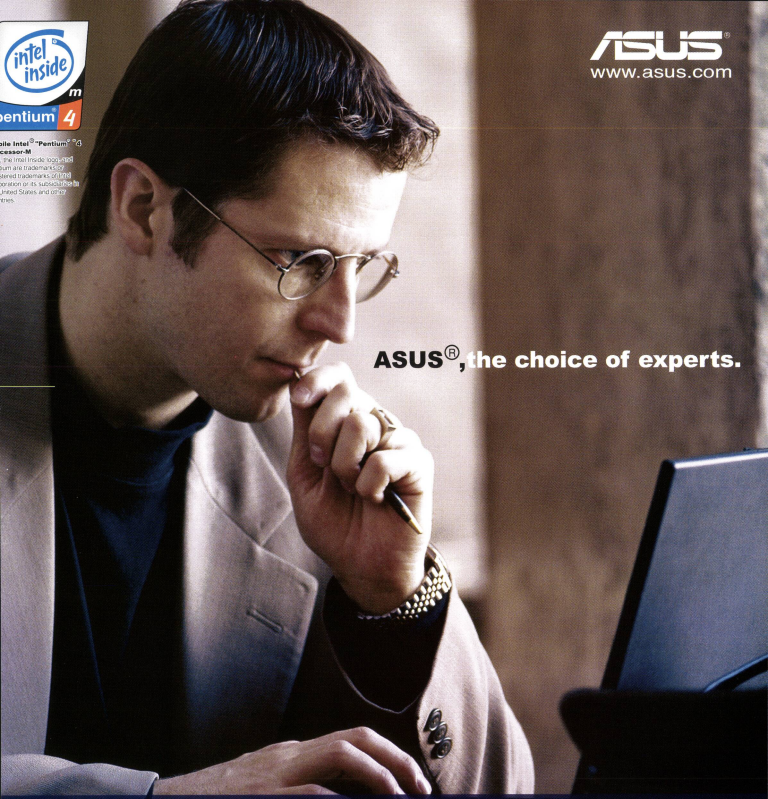


Details >>

CPU AMD Duron 1300
RAM 256MB PC2100 DDR
Graphics card Onboard S3 ProSavage 8
Hard disk 30GB Maxtor Ares
CD/DVD 16x/10x/40x/12x Panasonic combo DVD-ROM/CD-RW
Audio On board AC97
Speakers UltraView 180 watt
Monitor UltraView 17" Shadow Mask
OS Windows XP Home
Contact Also Technology
Phone (02) 9519 4600
Online www.alsotech.com.au
Price $1,149

Verdict >>

Performance
Bang/buck
Features
Overall



1 Series
Style!
he perfect harmony of advanced
chnologies and beautiful design.

L2 Series
AUDIO DJ!
You can listen to CDs even when
the notebook is off.

S1 Series
Light and versatile,
it's everything you need inside 1.8 kg!

L3 Series
Superior Battery
Efficiency up to 3hrs!

M2 Series
Slim in Size, Rich in Features,
Enjoy Life, Manage your world.

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LD:
OMPUTER ALLIANCE 3420-3200

NSW:
AVO TECHNOLOGY 9959-3373
COMPUTER WAREHOUSE SYDNEY 9519-2888
ECOM COMPUTERS 1-300-369-838
KS COMPUTERS 9908-8288
THX 8262-1588

BEYOND COMPUTER 8259-1000
DIGITALSTAR 9605-2868
PRINCETON COMPUTERS 9313-8811
NOTEBOOK WORLD 9267-2233

VIC:
CENTRE COM 9530-0988
COMPUTER WORLD 9419-8922
COMPUTER SOURCE 9348-0338
I.STORE 9670-9686
LANKMARK COMPUTERS 9899-4424
TOP 5 COMPUTER 9614-1355

WA:
AUSTIN COMPUTERS 9201-2788
COMPUTER CYBERSHOP 9227-8589
TANG COMPUTERS 9791-2454

$1,500–$2,499 systems

Not quite budget, not quite first-class, but performance and specs are right on the money in this category.

In this class you will find machines that may be lean on features and lack the bells and whistles that are standard fare in the higher classes, but you will also find that high-octane performance does not have to break the bank.

Making a regular appearance in this class is the GeForce4 Ti4200 graphics card, which provides outstanding 3D performance without the high price of the GeForce4 Ti4600, or indeed the premium outlay for the new Radeon 9700.

Even so, Australia IT and Pioneer Computers both managed to slip a GeForce4 Ti4600 into their $1,500–$2,499 systems. Again we see that the Athlon XP makes a regular appearance up to the Thoroughbred Athlon XP 2200+, clocked at 1.8GHz.

Also on show is the powerful Pentium 4 CPU, between 2GHz and the current flagship 2.8GHz processor.

Joining forces with 256MB or 512MB of PC2700 DDR RAM, you have a system that is very competitive with the A-grade machines submitted to the PC megatest. If you're after raw performance without the decorations, then the best systems in this class are your choice bet.

While there are some small compromises in the selected PCs, bonuses in flat-CRT monitors or a decent set of 5.1 speakers can be had.

Australia IT

AIT M2 Series

Blistering performance, some good quality extras and great value make the AIT M2 Series an easy winner.



If there's one thing that the AIT M2 Series system proves, it's that blistering performance does not have to burn a hole in your wallet. A hefty score of 11,734 in 3DMark and an impressive 211 frames per second in Quake 3 at the standard 1,024 x 768 resolution will more than satisfy the prospective gamer. Similarly, office tasks are a breeze, evident in a highly competitive score of 64.6 in Business Winstone 2001. Propelling the AIT M2 series to these stellar benchmarks is the powerful Athlon XP 2200+ — actually a 1.8GHz CPU — and 512MB DDR RAM running at the specified maximum 333MHz (PC2700) off the ASUS A7V333 motherboard, although the RAM is rated at 400MHz (PC3200).

apc EDITOR'S CHOICE NOV 2002

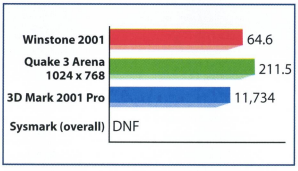
This speed rating gives you a little room for overclocking, something the AIT M2 series is clearly prepared for with the copper CPU heatsink for efficient cooling.

Despite the sub-$2,500 price tag, performance is further enhanced with the nVidia flagship GeForce4 Ti4600 from Sparkle, not a well-known brand, but it tested without problem.

To stay under $2,500, Australia IT build the system in a very generic midi-tower case and provides competent, but ordinary, Yamaha 2.1 channel speakers. A network card is notably absent, however.

Saving graces can be found in the quality Samsung 17in Flat-CRT screen, Sony 16x DVD and 48x/12x/40x CD-RW drives, and Microsoft mouse and keyboard.

If aesthetics don't bother you, the AIT M2 Series is a cranking machine for its class.



Details >>

CPU AMD Athlon XP 2200+
RAM 512MB PC2100 DDR
Graphics card Sparkle GeForce 4 Ti4600 128MB Platinum Edition
Hard disk 60GB IBM Deskstar 120GXP
CD/DVD 16x Sony DVD-ROM, 40x12x48 Sony CD-RW
Audio On board
Speakers Yamaha TSM201
Monitor Samsung SyncMaster 753DFX
OS Windows XP Home
Contact Australia IT
Phone (03) 9543 5855
Online www.australiait.com.au
Price $2,499

Verdict >>

Performance
Bang/buck
Features

Overall





Acer
Aspire G600

There are two Acer Aspire G600s, with a $1,000 difference between them. The main defining feature is that the $3,499 Aspire has a 19in monitor and this — the cheaper version — has a 17in screen.

The little 2.1 speaker kit is surprisingly good, with plenty of bottom-end, but it doesn't compare to the Altec Lansing 251 kit that comes with the more expensive Aspire G600. CD playback sounds great for music, but if you want a home theatre with Dolby Surround support, forget it.

Sound is processed by an onboard adaptor instead of the premium Creative Labs Sound Blaster Audigy used in the other Aspire. Even if 5.1 speakers were provided, the onboard adaptor would be incapable of supporting them fully.

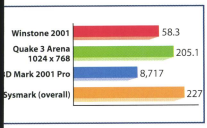
The 120GB Maxtor hard disk in the $3,499 Aspire is replaced here by a 80GB Seagate Barracuda IV drive. There's still ample storage between this drive, the Pioneer DVD-ROM and the Lite-On CD-RW to cover all eventualities. The front hatch even has slots for SD and Memory Stick flash memory.

All other appointments — including the FireWire adaptor, networking and software — are identical to the $3,499 version. It would appear this $2,499 model is a better buy than the other Aspire G600, if you're prepared to mix and match upgraded peripherals such as monitors and speakers.

To summarise, it's a nice package at this price.

Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB PC2100 DDR
Graphics card GeForce 4 Ti4200 64MB
Hard disk 80GB Seagate Barracuda IV
CD/DVD 16x Pioneer DVD-ROM, 40x12x32 Lite-On CD-RW
Audio On board
Speakers Acer A301T
Monitor Acer 711 (17in Shadow mask)
OS Windows XP Home
Contact Acer
Phone 1300 362 328
Online www.acer.com.au
Price $2,499



Verdict >>

Performance
Bang/buck
Features
Overall

Pioneer
SOHO PC

When you're testing as many systems as *APC* has done in this megatest, you'd expect to see a fair share of the good and the bad. Pioneer's SOHO PC falls into the latter category.

Firstly, the system arrived with the side panel unattached and the screws missing from the cheap Superpower case — hardly confidence-inspiring.

On the inside the SOHO PC looks to be a reasonable machine with a capable spec, centred on a Pentium 4 2.4GHz CPU and Leadtek GeForce4 Ti4600. Connected to Intel's own D845EBG2 motherboard, Pioneer has included 256MB DDR RAM, running at the maximum supported 266MHz.

However, at this price point the lack of a modem or network connection is unforgivable, doubly so for a system that's intended for the home office or small office.

Similarly, an LG 16x DVD drive occupies sole position on the optical drive front when a CD-RW would make far more sense.

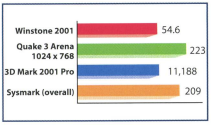
On the other hand, the excellent SoundBlaster Audigy and Creative's Inspire 5100 speaker set ensures that the audio is well looked after. The same can't be said of the Hitachi CM615 monitor, which is at best an ordinary screen.

3D benchmarks were pleasing, achieving 11,188 in 3DMark, but in 2D it strays behind the rest with a pedestrian 54.6 Winstone result. And pairing the Microsoft Internet keyboard with a no-name two-button mouse lacking a scroll-wheel is another odd call.

Even on its own merits, and despite the occcasional quality component, the SOHO is at best uninspiring. If you're in the market for a true SOHO system, keep looking.

Details >>

CPU Pentium 4 2.4GHz
RAM 256MB PC2100 DDR
Graphics card Leadtek A250 Ultra GeForce4 Ti4600 128MB
Hard disk IBM Deskstar 60GB ATA/100 7,200rpm
CD/DVD LG 16x DVD
Audio Creative Labs SoundBlaster Audigy
Speakers Creative Inspire 5100 5.1
Monitor Hitachi CM615 17in CRT
OS Windows XP Home
Contact Pioneer Computers
Phone (02) 9690 2888
Online www.pioneercomputers.com.au
Price $2,499



Verdict >>

Performance
Bang/buck
Features
Overall

Labs Challenge



Plus Corp
Aspect T2

The T2 is a mid-range priced PC, matching excellent performance with a good features list and an unpretentious look. The ASUS A7V333 motherboard is highly regarded by gamers and performance junkies alike. It's got everything you'd want: onboard ATA133 RAID support, FireWire, USB2.0 and 6-channel surround sound. Eight USB ports are standard equipment on the T2 — two are located on the front panel.

The Athlon XP 2000+ has become a popular low-cost alternative to its Intel equivalent, opening doors for users wanting blazing performance without the wallet-burning price. The T2 exploits that notion well, offering lots of bang per consumer buck. A CD-burner of some sort is considered standard fare on a PC these days and the T2 provides the Lite-On CD-RW drive and Nero 5 software.

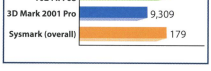
In addition, a DVD-ROM with WinDVD gets you into cinema mode. A huge 19in Samsung monitor graces the front end of the package, with resolution capabilities of up to 2,048 x 1,536. Although an 85Hz refresh rate is only sustainable up to the 1,600 x 1,024 mark, that should be enough for even the most adventurous graphic designer.

Triplex is a new-ish kid on the video card block but its gear is totally up to scratch when it comes to performance figures. The installed Ti4200 has 128MB of memory and a TV (SVHS) video-in/out port, as well as DVI and VGA outputs. MadOnion 3DMark scores were a smidgen under the hallowed 10,000 and Quake 3 was fragging away nigh on 190fps in XGA mode.

The T2 is well worth considering when wading through the sea of mid-priced machines.

Details >>

CPU AMD Athlon XP 2000+
RAM 512MB PC2700 DDR
Graphics card Triplex Millenium Silver GeForce4 Ti4200 128MB ViVo
Hard disk 80GB Seagate Barrcuda IV
CD/DVD 48x12x48x Lite-On CD-RW, 16x DVD-ROM
Audio Integrated Cmedia
Speakers Altec Lansing AVS 300
Monitor Samsung SyncMaster 957p
OS Windows XP Home
Contact Plus Corporation
Phone 1800 007 587
Online www.pluscorp.com.au
Price $2,495



Verdict >>

Performance
Bang/buck
Features
Overall

Marvel
Performer 2100 XP

Marvel is flying its flag with the Performer 2100 XP. Firstly, it boasts the critically acclaimed Epox 8K5A2 motherboard as its cornerstone. Running on the board is the Athlon XP2100+. AMD's Athlon range of processors has gained wide recognition as a viable alternative to the Pentium family, thanks to its aggressive performance and sharp pricing.

There's no RAID support, but up to four hard drives can be installed on the ATA133 IDE ports — our review unit came with a single 80GB Western Digital spinning at 7,200rpm with an 8MB cache.

The GeForce4 Ti4200 MyVivo (Video In, Video Out) card had impressive 3DMark scores exceeding 10,000 and Quake performance of over 195fps in 1,024 x 768 mode.

The card is also capable of dual monitor support, a feature of particular note for those interested in video editing. The inclusion of Ulead's VideoStudio 6 software complements the hardware support.

The elegant casing houses the Sony DVD and CD-RW drives at the top of the unit. A further two bays are available for additional drive installation and a pair of easy to access USB ports.

An attractive Sony Trinitron 17in monitor produces the necessary photon output, but the very deep case takes up a fair share of precious desk space.

And those signature Sony aperture grille wires still interrupt the display with two horizontal lines. Many find the lines prove to be annoyingly obvious when working with light-coloured backgrounds.

In short, the Performer is exactly that — a good choice for graphics-intensive work and play, with a sweet price point and a brand-name monitor.

Details >>

CPU AMD Athlon XP2100+
RAM 256MB PC2700 DDR
Graphics card Leadtek Winfast GeForce4 Ti4200 64MB MyVivo
Hard disk 80GB Western Digital Special Edition
CD/DVD Sony 40x12x48x CD-RW, Sony 16x DVD-ROM
Audio On board AC97
Speakers Creative Inspire 2400
Monitor Sony 17in Trinitron
OS Windows XP Home
Contact Marvel Computers
Phone (02) 9680 9688
Online www.marvelcomputers.com.au
Price $2,495



Verdict >>

Performance
Bang/buck
Features
Overall



Briter Home

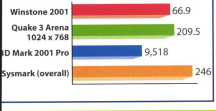
At board level, first impressions are good with this PC. Briter has plumped for Gigabyte's excellent 845E chipset-based GA-8IEXP motherboard. With onboard supporting RAID, the board represents a flexible, yet stable choice. Briter has married to the Gigabyte to a 2.4GHz Northwood Pentium 4 CPU.

During testing we found the Briter Home was running slightly above spec in CPU clock speed (the 2.4GHz CPU measured 2.43GHz) and the frontside bus (540MHz, up from 533MHz). This wasn't deliberate overclocking — it's the kind of occasional variance that simply can happen from one machine to the next, and these small variations have no impact on benchmarking. The key point was that the system ran fast and remained stable when running.

The Winstone score of 66.9 is a beauty. Sysmark did not run to such impressively high levels, but the benchmark is renowned as a fickle performer. In the case of the Briter Home, Sysmark ran flawlessly.

Briter did well to bundle the CDRW and DVD-ROM drives in a system at this price point. More negatively, even though the onboard sound supports Dolby Surround, the Yamaha 2.1 speakers bundled with the system lack depth and that crucial bottom end.

The Briter Home PC looks unassuming. The ordinary appearance is contrasted by the distinctive flat 17in CRT Hyundai ImageQuest Q770 monitor supplied. Supporting a maximum resolution of only 1,280 x 1,024 pixels at 60Hz refresh, the Hyundai doesn't hit the professional level of 85Hz as a minimum refresh, but it's far easier on the eyes than most monitors in this price range.



Details >>

CPU Intel Pentium 4 2.4GHz
RAM 256MB PC2100 DDR
Graphics card Abit Siluro GeForce 4 Ti4200 64MB
Hard disk 80GB Western Digital Special Edition
CD/DVD 40x12x48 Lite-On CDROM, 16x DVD-ROM
Audio On board AC97
Speakers Yamaha YSTMS201
Monitor Hyundai Q770
OS Windows XP Home
Contact Briter Computers
Phone (03) 5940 1698
Online www.briter.biz
Price $2,490

Verdict >>

Performance
Bang/buck
Features
Overall

High-end CPUs

Pentium 4

The Pentium 4 CPU has suffered some growing pains and has struggled to win back a market enamoured by the AMD Athlon processor's various flavours. The Northwood core, however, has reversed the trend, packaging the Pentium 4 in a 0.13-micron die, and bolstering the L2 cache from 256K to 512K.

Combined now with a 533MHz quad-pumped bus, it's just the shot in the arm Intel's Pentium 4 needed to retake the lead — performance results lived up to expectations and edged ahead of the Athlon.

The Pentium 4 represents a dramatic change in CPU architecture and is geared towards high-bandwidth applications such as streaming media, allowing Intel to ramp up clock speeds. As such, the main feature is a massive 20-stage pipeline, keeping up to 126 instructions in-flight, with an Execution Trace Cache designed to keep it clean and fed by preventing branch mis-predictions.

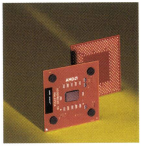
ALUs (Arithmetic Logic Units) execute instructions at twice the clock speed, and a wide palate of chipsets support the Pentium 4, coupling it with SDR RAM, DDR RAM, and RD RAM.

Athlon XP

Even though the Pentium 4 has regained the speed title, the Athlon XP is still much faster and better value per megahertz of performance. While the latest Thoroughbred core has shrunk to 0.13-microns, the architecture had not undergone any significant changes until the recent release of the Athlon XP 2400+ and 2600+, actually 2GHz and 2.13GHz CPUs respectively.

AMD has added an extra metal layer for a total of nine, which complicates the manufacturing process, but allows greater optimisation of electrical paths within the chip, thus squeezing more speed from an architecture that is close to its ceiling.

With a large 128K L1 and 256K L2 cache, the Athlon XP now runs on a 333MHz DDR system bus, significantly boosting performance, and comes in the SocketA 432-pin form factor. The memory choice *du jour* is DDR RAM, combining to make the Athlon XP a tremendous all-round, do-everything processor.



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Labs Challenge





CWS
QUAMPRO 5020

The name is a mouthful but the QUAMPRO 5050 is easy to swallow. $2,479 gets you a 2.4GHz Pentium 4, Leadtek Winfast GeForce4 Ti4200 graphics card and most notably, a whopping 768MB of PC2100 DDR RAM.

These are nestled in the strong performing Gigabyte 8IE motherboard, featuring the i845 chipset and the supporting 533MHz frontside bus (FSB) speed of the latest Pentium 4s. Storage is looked after with the ever-reliable 80GB ATA/100 Seagate Barracuda IV.

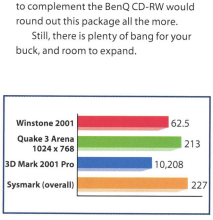
With 10,208 3DMarks you'll be happily playing all the latest games, though it fell behind the 11,010 3DMarks of the Altech Silver Raid in the same price category. However, it clearly outgunned the Silver Raid in Winstone 2001, achieving a solid score of 62.5, making it very suitable as an office application workhorse. CWS has used the same chrome-coloured case featured heavily throughout the round-up, which has a massive total of five spare hard drive mounts, and three spare 5.25 optical drive bays for future additions.

Of course, in offering generous features inside the box there are some compromises. The ordinary ViewSonic 17in monitor, with curved shadowmask screen, is one. The dreadfully cheap and nasty keyboard with tinny action and loose keys is definitely another. For an extra $20 or so a decent keyboard would make using the computer enjoyable, and still stay within the $1,500-$2,500 range. Likewise, an extra optical drive, preferably DVD, to complement the BenQ CD-RW would round out this package all the more.

Still, there is plenty of bang for your buck, and room to expand.

Details >>

CPU Intel Pentium 4 2.4GHz
RAM 768MB PC2100 DDR
Graphics card Leadtek GeForce 4 Ti4200 128MB
Hard disk 60GB Seagate Barracuda IV
CD/DVD 48x12x40x BenQ CD-RW
Audio On board AC97
Speakers Brandless sub-woofer speakers
Monitor Viewsonic E70
OS Windows XP Professional
Contact CWS
Phone (02) 9519 2888
Online www.cwsydney.com.au
Price $2,479



Verdict >>

Performance
Bang/buck
Support
Overall

Impact
A1800

The Impact A1800's plain midtower case reveals little of the computing power beneath. Its beige skin is wrapped around the high-end Gigabyte GA-7VRXP motherboard sporting the AMD Athlon XP 1800+ CPU. This is a package that delivers value for money and lacks nothing for the home or small business user.

The gradual price decrease for LCD panels has allowed OEMs like Impact Systems to include a TFT screen (it's a 15in Polyview panel). But the display's built-in speakers sound absolutely woeful, and the volume control is only available through the onscreen display. Fortunately, Impact includes a meatier set of Altec Lansing speakers to plug into the onboard Creative sound controller. This is adequate for casual gaming, just don't expect cinema-grade sound.

The eight USB ports will help add any number of peripherals and half of them are USB 2.0. It's just a pity that none of these ports are located on the front panel.

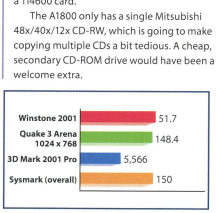
A better choice of case would have made a big difference for the user, who is forced to root around the A1800's rear panel to plug and unplug each device. At least with eight ports you won't have to do much unplugging.

ASUS GeForce4 MX460 is used for the visual output, and it gave surprisingly high results in the Quake 3 test (140fps at 1,024 x 768 resolution). The 3DMark 2001 was just over 5,500 — barely half of the score achieved by similar machines equipped with a Ti4600 card.

The A1800 only has a single Mitsubishi 48x/40x/12x CD-RW, which is going to make copying multiple CDs a bit tedious. A cheap, secondary CD-ROM drive would have been a welcome extra.

Details >>

CPU AMD Athlon XP 1800+
RAM 256MB PC2100 DDR
Graphics card Asus GeForce 4 MX460 64MB
Hard disk 40GB IBM Deskstar
CD/DVD 48x40x12x Mitsubishi CD-RW
Audio On board AC97
Speakers Altec Lansing ACS22
Monitor Polyview 15in TFT
OS Windows XP Professional
Contact Impact Systems
Phone (02) 9621 2999
Online www.impactsystems.com.au
Price $2,450



Verdict >>

Performance
Bang/buck
Features
Overall

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128 M SDRAM, (or 256M +$99)
15G HD, 24 X CD Rom
14.1" XGA TFT, Up to 64M VGA
100/10M Lan+56K Modem
8 cells Li-ion battery, 2xUSB
3D Audio Stereo System
MS Windows XP Home



Pioneer POWER Notebook P2400

RRP $3990

Intel® Pentium® 4 Processor 2.4Ghz
256 M DDR RAM (or 512M +$190)
Intel® 845 chipset, 40 GB HD, 1.44M FD
8x DVD & CDRW COMBO
15" TFT(1400x1050), ATI M7P 64M DDR VGA
5.1 S/PDIF Digital Audio
100/10M Lan+56K Modem+1394 Firewire
4 USB ports, PCMCIA, TV out
MS Windows XP Home



Pioneer SOHO Notebook P1200

RRP $2490

Intel® Pentium® III Processor 1.2Ghz
128 M SDRAM, (or 256M +$99)
20 GB HD, 8X DVD, 1.44M FD
(Or CDRW+$160, or 8xDVD&CDRW+$250)
14.1" TFT LCD XGA, Up to 64M VGA
100/10M Lan+56K Modem+2xUSB
1394 Firewire, TV Out, All In One
3D Audio Stereo System
MS Windows XP Home



Pioneer SOHO Notebook P2000

RRP $2990

Intel® Pentium® 4 Processor 2.0Ghz
256M DDR RAM
20 GB HD, 8xDVD&CDRW Combo
14.1" TFT LCD XGA (15" +$250), Up to 64M VGA
100/10M Lan+56K Modem+3xUSB
1394 Firewire, TV Out
5.1 S/PDIF Digital Audio
MS Windows XP Home



Pioneer SOHO LCD PC P2000

RRP $2990

Intel® Pentium® 4 Processor 2.0Ghz
128M DDR RAM
40 GB HDD 7200 RPM IDE
100/10M Lan+56K Modem +1394 Firewire
24X CD Rom, 1.44M FDD
AC'97 3D Audio
15" LCD TFT XGA, 32M VGA
4 USB ports and PCMCIA slot
Keyboard and mouse
MS Windows XP Home



Pioneer POWER PC P2400

RRP $2690

Intel® Pentium® 4 Process or 2.4Ghz
Intel 845 Chipset Pentium 4 Motherboard
256 M DDRRAM / 40 GB HDD 7200 RPM IDE
TI4600 GeFORCE 4 128M +TV OUT AGP
Sound® Blaster Live! Digital Entaiment 5.1
ATX Midi Tower Case
Creative® Inspire 5.1 5300 Desktop Theater
16X DVD, 1.44M FDD, 56K Int.Modem
HITACHI 17" CM615 Monitor
MS internet K/B, Mouse. Win XP Home



Pioneer POWER Server X2200

RRP $4290

Intel® Xeon® Processor 2.2Ghz (Dual Capable)
Supermicro P4DMS-6GM Motherboard
256M RAM, Adaptec Dual Ultra 160 SCSI Card
36 GB 10K RPM SCSI HDD
ATI Rage XL 8MB VGA, Intel 1G NIC
52X CDROM and 1.44M FDD
7 Hot-swap SCSI Drive Bay, 420W Redundant P/S
Supermicro 4U Rackmountable Tower Case



Pioneer SOHO Server P2000

RRP $2390

Intel® Pentium® 4 Processor 2.0Ghz
Supermicro P4SBE 845 Motherboard
128 M SDRAM, (or 256M +$99)
40 GB HDD 7200 RPM IDE
ATI Rage XL 8MB VGA
2x Intel 10/100M NIC
Slim CDROM and 1.44M FDD
Supermicro IU Rackmount Case

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Labs Challenge





IBM
NetVista A30

This is one of the more attractive and functional PCs in the NetVista series. The system unit is a squat mini-tower with some front-mounted USB and audio ports and, thankfully, no nuisance trapdoor hiding the external storage. The chassis, keyboard, mouse and monitor are all tagged with the IBM logo.

Inside — and in a departure from the usual practice — there's a Gigabyte motherboard based on the Intel 845G chipset. In the past, IBM had used as much of its own branded technology as possible. It wasn't easy for us to pick up the Gigabyte logo.

The interior is particularly crowded. Everything is modular, the drive cage and power supply snaps in and out, but airflow must be at a premium, even with the case fan. Access to the memory banks is obscured and requires much dismantling if you want to get near.

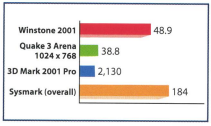
The other factor to note is that even for a P4 2.0GHz machine, this NetVista is *slow*. The Radeon 7000 AGP card is dated, scoring a paltry 2,130 3DMarks. There is an onboard adaptor that was disabled once the Radeon card was plugged in. Using this adaptor, 3DMark 2001 fared even worse, scoring only 1,307 3DMarks.

Situated alongside one of the souped-up performance machines in this megatest, the NetVista fails to rise to rise to the challenge in a performance sense.

However, there are extras from a brand name that you don't see from clones — like the IBM Rapid Restore facility and the fancy programmable keyboard.

Details >>

CPU Intel Pentium 4 2.0GHz
RAM 256MB PC2100 DDR
Graphics card ATI Radeon 7000
Hard disk 40GB IBM Deskstar 120GXP
CD/DVD 16x/10x/40x Lite-On CD-RW
Audio On board
Speakers IBM branded
Monitor IBM E74
OS Windows XP Home
Contact IBM
Phone 1800 289 426
Online www.ibm.com.au
Price $2,399



Verdict >>

Performance
Bang/buck
Features
Overall

Source Technology
Premium Value

This system is housed in a plain beige desktop case made from gauge steel with a no-nonsense security lock on the right side. Inside, it's more of the same: a PC that's built tough as a brick outhouse, and it's *heavy*.

Even the dual optical drives — a Sony DVD-ROM and a Sony CD-RW at the front — seem like a reluctant (but welcome, nonetheless) concession. In this category of computer, the tendency has been to fit multiple optical drives. Although the Analog Devices/SoundMax soundcard doesn't support the fancier codecs, it boasts an appealing feature set including environmental effects.

The bundled Altec Lansing ACS 33 2.1 speaker set is an appropriate match for the sound chip. While the sound subsystem reflected expediency, the AGP card showed that some forethought had gone into designing this system. Source Technology is Intel-centric — its product lines and manufacturing is centred on Intel products and procedures. For 2.1 speakers they're not too bad.

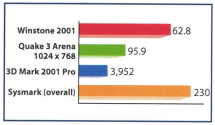
Source could have picked one of Intel's 845G or 845GL products, which would have saved on the cost of a dedicated AGP card, but by opting for the separate AGP card it has dramatically boosted performance.

In summary, this is a no-nonsense box with all the standard features you'd expect from a PC in this range. This system represents solid value, with the additional backup of a three-year warranty.

Forget coloured LEDs and transparent case cutouts, this PC avoids the frills and says "let's get down to business".

Details >>

CPU Intel Pentium 4 2.4GHz
RAM 512MB PC2100 DDR
Graphics card Pine GeForce 4 MX420 64MB
Hard disk 80GB IBM Deskstar 60GXP
CD/DVD 16x Sony DVD-ROM, 40x12x48 Sony CD-RW
Audio On board AC97
Speakers Altec Lansing ACS33
Monitor Mitsubishi Diamond View 1770H
OS Windows XP Home
Contact Source Technology
Phone (03) 9467 1966
Online www.sourcetechnology.com
Price $2,330



Verdict >>

Performance
Bang/buck
Features
Overall

MORE HEADROOM



intel inside
pentium 4

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Labs Challenge





Altech
Silver Raid

The Silver Raid is built around the outstanding VIA P4X400 chipset-based Soltek SL-85ERV motherboard. To help squeeze under the lower price point, it plays host to a Pentium 4 2.4GHz running on a 533MHz bus. Altech have chosen to populate the board with 256MB of PC2700 DDR RAM, with the same X-Micro GeForce4 Ti4200.

It all adds up into an effective package. The Silver Raid proved to be is no slouch in the benchmarking department, cracking the 11,000 3DMark barrier and posting a respectable Winstone 2001 score of 55.7 — more than adequate for business applications, and silky smooth in the latest crop of 3D game titles.

Forget about DVD movies, as the only optical drive is an AOpen 40x/12x/48x CD-RW. Also missing is a network card (an extra $30 or so).

At least you'll still have four spare PCI slots for future upgrades. Similarly, with three spare external drive bays there's enough room to fit whichever DVD-ROM drive takes your fancy. And at the asking price of $2,280, there's enough left over from our $2,499 price limit to add those missing components.

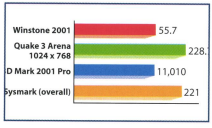
Quality peripherals include a Samsung SyncMaster 753DFX 17in Flat-CRT monitor and Creative Inspire 4.1 speakers connected to the onboard 5.1 channel sound chip. Not to be overlooked, Altech has included the standard, but nonetheless well-made, Microsoft Internet keyboard and PS/2 mouse. These make using the machine quite a pleasure compared to cheaper input options commonly used to snip the sticker price.

Details >>

CPU Intel Pentium 4 2.53GHz
RAM 256MB PC2700 DDR
Graphics card X-Micro GeForce 4 Ti4200 128MB
Hard disk 80GB Seagate Barracuda IV
CD/DVD 40x12x48 AOpen CD-RW
Audio On board AC97
Speakers Creative Inspire 4400
Monitor Samsung SyncMaster 753DF+
OS Windows XP Home
Contact Altech Computers
Phone (02) 9748 2233
Online www.altech.com.au
Price $2,280

Verdict >>

Performance
Bang/buck
Features
Overall



Boost
Bowam

This is quite a zippy little machine, with an Athlon XP 2000+ and 256MB of PC2700DDR RAM. These are plugged into a Gigabyte GA-7VRXP motherboard which includes two USB 2.0 ports, onboard LAN, a Promise ATA-133 RAID controller and 5.1 onboard sound (thanks to the Creative CT5880 chipset).

A 64MB GeForce 4 Ti4200 occupies the 4x AGP slot, and helps the Bowam achieve nearly 10,000 under 3DMark 2001 Pro.

In *APC's* recent hard disk round-up (*APC* September, page 59), the Western Digital Caviar was consistently among the fastest of the hard disks we looked at (only topped by the phenomenal Western Digital Special Edition drive that makes use of an 8MB cache to achieve blistering speeds). The Bowam includes a 60GB Caviar, which helped the machine earn a respectable 16,500 under the WinBench High-End Disk test.

The screen however let the Bowam down. Many of the PCs in the this price category today come with TFT panels or flat CRTs. Boost supplied an atrocious 19in Likom monitor. We'd have much rather preferred to have seen a good quality 17in monitor over a poor 19in. The picture suffered from blurriness and the colours appeared washed-out. We ended up switching to a smaller, clearer CRT for our benchmarking.

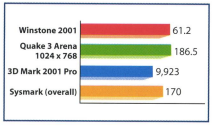
Boost came in $250 short of the limit for this category. The extra money could have been used to ply the PC with more RAM, add a DVD-ROM drive, or even better, push the choice of monitor one ot two rungs up. Any of these would have turned the Boost Bowam from a great machine into the clear winner for the category.

Details >>

CPU AMD Athlon XP 2000+
RAM 256MB PC2700 DDR
Graphics card TripleX Millennium Silver Ti4200 64MB
Hard disk 60GB Western Digital Caviar
CD/DVD 40x12x48 LiteOn CD-RW
Audio On board AC97
Speakers Hercules XPS210
Monitor Likom Tap 19
OS Windows XP Home
Contact Boost Computers
Phone (08) 8410 2722
Online www.boostcomputers.com
Price $2,249

Verdict >>

Performance
Bang/buck
Features
Overall







$1,500–$2,499

Optima
My PC Pentium 2.4GHz

Speed is what we're after. Optima, however, has decided to ignore this and offer a system that is slow. Not only slow, but for what you get, expensive. There are a few glimpses of quality components but as the benchmark scores show, it doesn't set the world on fire.

The main speed issue comes from the Intel 82845G video controller. Integrated onto the ASUS P4B533M motherboard, under testing the system could only achieve a dismal 1,286 on 3DMark 2001 Pro. Quake 3 Arena tests reaffirmed our dismay with the 1,024 x 768 at 32-bit test scoring a dismal 20.1fps.

Even the fast Pentium 2.4GHz CPU can't compensate for such a slow video controller. The good news is there's a free AGP slot so, at worst, you could slot in your own, better specified video.

For your $1,997 you do however get a fast CD rewriter. The Diamond Data DD401248 CD-RW can burn a CD at 40x or rewrite at 12x, which is very quick.

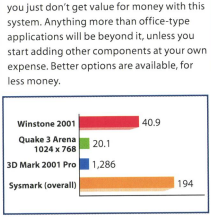
The 17in Optima CM712T monitor — a rebadged Sampo KM-712 — provides quite a good display that is clear, bright and with good colour reproduction. However, it's fairly big.

The 40GB Seagate ST340810A hard drive also helped the system achieve decent Winbench 99 scores, even though it's only rated at 5,400rpm.

Maybe if the Optima My PC Pentium 2.4GHz was in the sub-$1,500 category we would have been more sympathetic, but you just don't get value for money with this system. Anything more than office-type applications will be beyond it, unless you start adding other components at your own expense. Better options are available, for less money.

Details >>

CPU Intel Pentium 4 2.4GHz
RAM 256MB PC2100 DDR
Graphics card Intel 82845G integrated
Hard disk 40GB Seagate ST340810A
CD/DVD Diamond Data DD401248 CD-RW
Audio Onboard AC'97
Speakers 120W Optima Satellite
Monitor Optima CM712T 17in
OS Windows XP Home
Contact Optima Computers
Phone (02) 9475 2777
Online www.optima.com.au
Price $1,997



Verdict >>

Performance
Bang/buck
Features
Overall

Dell Optiplex
GX260

This is one of two Dell Optiplex GX260 machines submitted to this megatest. It offers an alternative and less expensive arrangement of components, but it's still geared towards the same large-scale corporate operation.

The case sports the same black and grey desktop form factor as the Optiplex GX260 in the $2,500-$3,500 category. In this PC, however, the system is cut back to a performance limiting 128MB PC2100 DDR RAM, with half the storage space in the 20GB ATA 100 hard drive. This was barely enough even two years ago. Today the Optiplex looks under-spec'd.

This system doesn't look as suited to a reception desk as its better-featured namesake, replacing the neat TFT display with a rather average 17in shadowmask CRT monitor. Clearly, this version of the Optiplex GX260 is meant for mundane office tasks, like word processing, inventory-keeping or email.

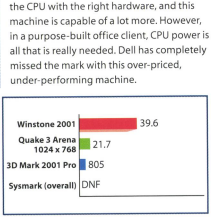
Not surprisingly, the benchmark results are far from spectacular, though given the purpose it was built for, the system does not pretend to offer otherwise. Winstone 2001 gave an outcome of 39.6 — extremely slow by current standards.

It also earned the wooden spoon in the 3DMark tests, achieving a diabolical score of 817, despite Intel's "Extreme Graphics" moniker for the integrated i845G video support.

Despite the sluggish benchmark scores it does have a 2GHz Pentium 4 CPU. Combine the CPU with the right hardware, and this machine is capable of a lot more. However, in a purpose-built office client, CPU power is all that is really needed. Dell has completely missed the mark with this over-priced, under-performing machine.

Details >>

CPU Intel Pentium 4 2.0GHz
RAM 128MB PC2100 DDR
Graphics card Intel Extreme Graphics i845 integrated graphics
Hard disk 20GB Seagate Barracuda IV
CD/DVD 8x CD-ROM
Audio On-board AC'97
Speakers Internal
Monitor Dell 17in Shadow mask CRT
OS Windows 2000 or XP
Contact Dell
Phone 1800 812 393
Online www.dell.com.au
Price $1,990



Verdict >>

Performance
Bang/buck
Features
Overall

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Kingston 512MB DDR RAM
Sony DVD-ROM/Lite-on DVD-ROM
Sony 48x40x12 CD-RW/Lite-On (48x48x12)
hardwarezone.com user rating ★★★★
Sony Floppy Drive
Seagate 60.1GB/WD 60.1GB 7200 rpm HDD
Winfast 64MB Geforce4 MX 440 & TV out
hardwarezone.com user rating ★★★★
Patrol 56K V92 Fax/Voice or 10/100 Network Card
Black 17" Philips Monitor
Black KeyBoard and Mouse
Black 600 Watt Subwoofer, AC 97 Sound
Black-on-Metallic Tower, AMD/Intel Approved
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AMD Athlon XP 2200 $2295 / $24 pw
AMD Athlon XP 2400 $2395 / $25 pw

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(PC Authority's Lab Winner)
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Sony DVD-ROM/Lite-on DVD-ROM
Sony 48x40x12 CD-RW/Lite-On (48x48x12)
Sony Floppy Drive
Winfast 128MB Ti 4200 ViVo Video Card
Patrol 56K V92 Fax/Voice or 10/100 Network Card
Black Keyboard and Mouse
Black 600 Watt Subwoofer, AC 97 Sound
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Intel Pentium 4 2.53 $3095 / $31 pw
Intel Pentium 4 2.67 $3445 / $35 pw

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Gigabyte Radeon 9700 Pro, 128MB/256BIT/AGP8X
hardwarezone.com user rating ★★★★½
Kingston 512 DDR RAM PC2700
Sony DVD-ROM/Lite-on DVD-ROM
Sony 48x40x12 CD-RW/Lite-On (48x48x12)
Sony Floppy Drive
WD 80.1GB 7200 rpm 8MB Buffer (Lab Winner)
19" Auriga 19TF Flat Monitor
6 channel integrated Sound on board
Creative Inspire 3- Piece 2400 Speakers
Black Keyboard and Mouse
Black-on-Metallic Towcr AMD/Intel Approved
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Options

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Seagate 80.1GB 7200 rpm HDD
Sony DVD-ROM/Lite-on DVD-ROM
Sony 48x40x12 CD-RW/Lite-On (48x48x12)
Sony Floppy Drive
Winfast 64MB Geforce4 MX 440 & TV out
hardwarezone.com user rating ★★★★
6 channel integrated Sound on board
Patrol 56K V92 Fax/Voice or Network Card
Microsoft Windows XP Home Edition on CD
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Intel Pentium 4 2.53 $3095 / $31 pw
Intel Pentium 4 2.67 $3445 / $35 pw

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ASUS Ti4600 Deluxe	$ 245
Macase KA-230B Black Case	$ 145
19" IBM Flat Trinitron Tube	$ 525

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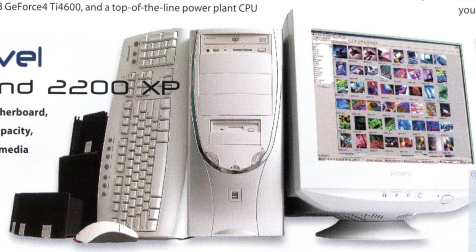
In this category, all the components are high-quality, brand name offerings with no corners cut to keep the price in check. 256MB of DDR SDRAM, a 128MB GeForce4 Ti4600, and a top-of-the-line power plant CPU form a solid building block for any screaming-fast PC. Throw these into a system with approximately 80GB of hard disk space and you're primed for gaming, video editing, or — dare we say it — everyday office work.

The biggest question you'll have to answer when shopping in this price range is whether to go for a flat 17in CRT or a 15in TFT monitor. Gamers will prefer a high-end 17in CRT, but TFTs are constantly improving, as their price slowly works its way down.

Of course, how you decide to allocate your money is your call. Many of the machines in this price range were even packed with half a gigabyte of RAM and a TFT screen. If you are able to allocate $3,500 for a system, you will walk out with a weapon set to break some speed records.

Marvel Legend 2200 XP

A high-end motherboard, huge storage capacity, and great multimedia capability see this PC live up to its name.



You can enjoy plenty of power these days for $3,495. Marvel's Legend 2200 XP is a great example of this. Everything about this system appears to have been carefully matched and manicured to create a desktop performance demon.

apc EDITOR'S CHOICE NOV 2002

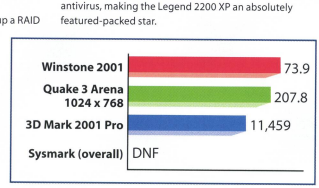
The groundwork is laid by the EpoX EP-8K5A2+ motherboard, powered by the VIA KT333 chipset. This comes with integrated network port, 5.1 digital audio care of the Realtek 650 sound chip, USB 2.0 support, and the two-channel HighPoint 372 ATA133 IDE RAID controller, in addition to the regular ATA100 IDE channels.

Capable of RAID 0, 1, or 0+1, Marvel has set up a RAID 0 system with two Western digital 80GB ATA100 7,200rpm hard drives both sporting a huge 8MB buffer. In effect, the Legend 2200 XP has an ultra-fast 160GB hard drive, which in this case is split into three drive partitions.

Examining the outrageously quick Winstone score of 73.9 and WinBench results (32,500 for Business Disk and 59,000 for High-End Disk), the impact on application performance is clear, especially when it comes to writing large amounts of data to disk.

The Legend 2200 XP did not achieve these results without the help of the Athlon 2200 XP+, 512MB PC2700 DDR RAM and a Leadtek GeForce4 Ti4600, which also makes it an exceptional gaming machine, as the 11,459 3DMarks it scores attest.

Multimedia action will greatly benefit from the top quality Sony 17in Flat-CRT, and SoundBlaster Audigy with Creative Inspire 5.1 surround speakers at the business end. A Sony DVD and CD-RW drive complete an outstanding hardware ensemble. To fully round-out the package, Marvel includes a huge software bundle, including VideoStudio 6 and PC-cillin antivirus, making the Legend 2200 XP an absolutely featured-packed star.



Details >>

CPU AMD Athlon XP 2200+
RAM 512MB PC2700 DDR
Graphics card Leadtek Winfast GeForce4 Ti4600 128MB
Hard disk 2 x 80GB Western Digital Caviar in RAID 0
CD/DVD Sony combo DVD-ROM, 48x/12x/40x CD-RW
Audio Creative Labs SoundBlaster Audigy
Speakers Creative Inspire 5100 5.1
Monitor Sony 17in CPD-E230 Flat-CRT
OS Windows XP Home
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Price $3,495

Verdict >>

Performance
Bang/buck
Features
Overall





Acer
Aspire G600

This is the more expensive of the two Aspires in this megatest. It sits in Acer's consumer range — evident from the custom plastic mouldings around the system unit and monitor.

The Acer Aspire G600 is distinctive in shape. Stumpy is the best way to describe it, with its mini-tower chassis, bulbous front and a noticeable "hump" on top. Under the hump is a spindle and space for stacking used CDs. At the front is an array of controls which allow you to operate the DVD-ROM without the mouse or keyboard.

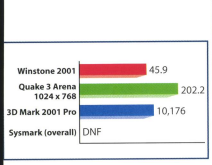
Acer has beefed-up this version's hardware specification considerably, particularly in the entertainment area. The onboard SiS 650 chipset lags a long way behind dedicated graphics, so the addition of a dedicated performance card represents enormous value. When the card in question is Acer's choice, a GeForce4 Ti4400, the machine's graphical capabilities are taken to a new level of performance.

Similarly, the onboard sound is supplanted by a dedicated Creative Sound Blaster Audigy card. Much the same benefits result — better sound, and less CPU drain. Supporting the Audigy are the excellent Altec-Lansing 251 speakers, which have proved popular with the entrants in this megatest.

This Aspire G600 represents value for money from a brand name. It's peace of mind and those cute extras like the front-mounted audio ports, SD card and Memory Stick readers that make a recognised brand such as this stand out.

Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB PC2100 DDR
Graphics card GeForce 4 Ti4400 128MB
Hard disk 120GB Maxtor D540X
CD/DVD 16x Pioneer DVD-ROM, 40x/12x/32x Lite-On CD-RW
Audio Creative Labs Sound Blaster Audigy
Speakers Altec Lansing 251
Monitor Acer 901 19in
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Verdict >>

Performance
Bang/buck
Features
Overall

Australia IT
M2

The M2 would look at home in even the most conservative workplace. The A7V8X motherboard is cutting edge technology from ASUS, incorporating AGP 8x and DDR400 (PC3200) RAM support thanks to the VIA KT400 chipset. Serial ATA is an optional extra.

Meanwhile, you can connect up to four ATA133 drives on the regular IDE channels. The single 80GB Western Digital hard disk, AOpen DVD and Sony CD-RW drives are all hooked up with shielded round IDE cables, making for a neat interior. They also assisted in increasing airflow, propelled by two intakes and two exhaust fans.

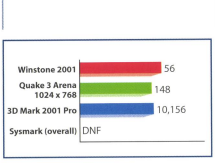
A matching black monitor would have topped the M2 off nicely, but the beige 17in flat screen Samsung will suffice. The latest ATI Radeon 9700 Pro video card fills the AGP slot and gave a 3D mark of well over 10,000. Quake 3 posed no problem to the 9,700, never slowing down with an increase in detail and resolution. A minimum of 145fps was sustained throughout testing.

Inspire 5100 speakers are a welcome addition and plug straight into the onboard 6-channel sound card. Of interest to those wishing to shift truckloads of data across a network very quickly is the Broadcom Gigabit (that's 1,000 Megabits) Ethernet chipset, which is included on the A7V8X.

Another striking feature of the M2 is its handsome case, which could almost pass for a mini bar fridge. It almost weighs as much as a fridge, too. The M2 is heavy, like its brother the T5, and is supported by four feet that swing out from its base.

Details >>

CPU AMD Athlon XP 2200+
RAM 512MB PC2100 DDR
Graphics card Power Color ATI Radeon 9700 Pro 128MB
Hard disk 80GB Western Digital Caviar
CD/DVD AOpen 16x DVD-ROM, Sony 40x/12x/48x CD-RW
Audio Onboard AC97
Speakers Creative Inspire 5100
Monitor Samsung 753DFX 17in
OS Windows XP Professional
Contact Australia IT
Phone (03) 9543 5855
Online www.australiait.com.au
Price $3,499



Verdict >>

Performance
Bang/buck
Features
Overall

Labs Challenge





Ecom
Signature Deluxe 4280

At first glance, it's hard to imagine where $3,500 would go on such a regular-looking PC. Upon closer inspection, it gets a *little* clearer. The Gigabyte GA-8IEXP is an excellent motherboard with USB 2.0, FireWire and a Promise RAID controller. It has six PCI slots but, as seems to be the problem with most Gigabyte models, the top one is so close to the AGP port that there is little hope of installing a card there.

In addition, the *bottom* two PCI slots are blocked by the USB and FireWire connectors, rendering them unusable. So effectively, you have three PCI slots.

The case has only one intake fan and none for expelling the heat produced by the high-speed components. There's a P4 2.8GHz CPU in there and 512MB of DDR RAM. To help things move along in the video department, a Winfast A250 Ultra with 128MB of memory resides in the AGP port. This top end GeForce Ti4600 means it's no surprise that the 3D Mark needle swung over to nearly 12,500, and Quake 3 ran at 244fps in 1,024 x 768 mode. Sysmark, too, scored an impressive 239 points overall.

The BenQ CD-RW drive is equipped with Nero 5.5 to assist with CD compilation, and movies can be viewed with the WinFast DVD software bundle.

The included Hitachi 19in monitor will take up a good half-acre of your desk space — and it's not even flat-screen. Considering the fact that the hard drive is "only" a single 60GB, you understand why we're scratching our collective heads over the price tag.

Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB PC2100 DDR
Graphics card Leadtek Winfast A250 Ultra MyVivo
Hard disk 60GB Seagate Barracuda IV
CD/DVD Pioneer 16x DVD-ROM, BenQ 40x/12x/48x
Audio Onboard AC97
Speakers Creative FPS 1000 Silver Millennium Edition 4.1
Monitor Hitachi CM715 19in
OS Windows XP Professional
Contact Ecom Computers
Phone (02) 9299 0022
Online www.ecomcomputers.com.au
Price $3,499



Verdict >>

Performance
Bang/buck
Features
Overall

Altech
Blue Fusion

From the sturdy, industrial-looking Antec case to the solid Soltek SL-85ERV motherboard — featuring VIA's P4X400 chipset — the Altech Blue Fusion is an impressive machine and an overclocker's delight.

The VIA P4X chipset range has consistently beaten Intel at its own game, outperforming the i845 chipset supporting the Pentium 4. The Blue Fusion posted a fast 64.4 Business Winstone 2001 result, and easily handled the 3D tests — posting 11,462 3DMarks. The P4X400 is compliant with the AGP 3.0 spec for future AGP 8X cards, supports USB 2.0, and comes with in-built 5.1 channel sound, although Altech has opted for a PCI SoundBlaster Live! 5.1 for quality sound support.

A 2.8GHz Pentium 4 runs the show, kept in check by a large Thermaltake copper CPU cooler with variable speed fan controlled via a small switch.

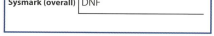
Unusually, the 80GB ATA 100 Seagate hard disk is mounted in the top 5.25in bay, where a Thermaltake display provides dedicated cooling and temperature readouts for the CPU and the GeForce4 Ti4200 GPU.

Hobbyists will also get a kick out of the rounded IDE cables which connect the drives, including the AOpen DVD and CD-RW units, and the two handy and quiet 80mm extraction fans at the back, which are both lit with blue lights.

The only detracting factor is the less expensive GeForce4 card, in comparison with some of the leading offerings. With a quality 19in Samsung Flat-CRT monitor, Creative 4.1 speakers and wireless Microsoft keyboard and mouse, it's hard to find fault with this machine.

Details >>

CPU Intel Pentium 4 2.2GHz
RAM 512MB PC3200 DDR
Graphics card X-Micro GeForce 4 Ti4200 128MB
Hard disk 80GB Seagate Barracuda IV
CD/DVD 16x AOpen DVD-ROM, 40x/12x/40x AOpen CD-RW
Audio Creative SoundBlaster Live! 5.1
Speakers Creative Inspire 4400
Monitor Samsung SyncMaster 955DF
OS Windows XP Professional
Contact Altech Computers
Phone (02) 9748 2233
Online www.altech.com.au
Price $3,490



Verdict >>

Performance
Bang/buck
Features
Overall



Impact P2400

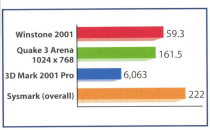
Impact has taken a conservative approach to the P2400 system, foregoing the bells and whistles. While not flashy, the compact midi-tower case is a good start; it has three optical drive bays and three internal 3.5in bays, plus one for the obligatory floppy. Unfortunately, the 80mm intake fan at the front was not secured properly, floating loose inside the case.

An Intel 845EBG2 motherboard forms the backbone of the system, sporting a Pentium 4 2.4GHz running on a 533MHz bus. Impact has stocked the P2400 with an ample 512MB 266MHz (PC2100) RAM with a comparatively modest GeForce4 MX460 in the graphics department. At the upper end of the budget range of GeForce4 derivatives, the MX460 is a conservative choice for a $3,450 machine.

The cash left over has been redirected to the Polyview 15in LCD. The passive light is easy on the eyes for those spending long working hours on the PC. For office purposes the Polyview fulfills the role, but there are much better quality screens available for games and multimedia work.

Similarly, the P4200 scores a decent 59.3 in the Winstone Business Disk test, but its 6,063 3DMarks is a mediocre result by current standards. As an office-style PC, the P4200 is missing the all-important network connection — it's supplied only with a 56K PCI modem.

Fortunately, Impact equips it with the mandatory DVD and CD-RW combination for handling media, complemented by a 60GB IBM ATA 100 hard drive. At this price-point however, other machines offer a more competitive package.



Details >>

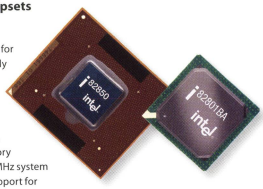
CPU Intel Pentium 4 2.4GHz
RAM 512MB PC2100 DDR
Graphics card ASUS GeForce4 V8170 PRO DDR MX460
Hard disk 60GB IBM Deskstar
CD/DVD Pioneer16x DVD, Mitsubishi 40x/12x/48x CD-RW
Audio Onboard AC97
Speakers Altech Lansing ACS22
Monitor Polyview 15in TFT
OS Windows XP Professional
Contact Impact Systems
Phone (02) 9621 2999
Online www.impactsystems.com.au
Price $3,450

Verdict >>

Performance
Bang/buck
Features
Overall

What's in a chipset?

Intel Pentium 4 chipsets



i850
This was the first chipset for the Pentium 4. It originally only supported RAMBUS (RDRAM) memory, which is very expensive. Performance is the name of the game, providing 3.2GB/s memory bandwidth. It has a 400MHz system bus and Ultra ATA100 support for hard disks. Onboard 6-channel audio controllers and AGP4x are also introduced in this chipset.

i850E
This is an update to the i850. It sports a 533MHz FSB for up to 4.2GB/s memory bandwidth. Some boards are designed with USB 2.0, ATA133 and RAID 1/0 support, although these were not in the original i850E specifications. The i850x series is not as popular as the i845 in consumer level PCs because of the costly Workstation-oriented RD RAM support.

i845
Intel's second chipset for the Pentium 4. It *only* has a 400MHz system bus, but adds DDR200 and DDR266 RAM support.

i845E
This supports the cheaper and very fast DDR SDRAM memory. System bus speeds are 400 or 533MHz, depending on the CPU installed. Six USB 2.0 ports are part of the spec, as is an onboard LAN controller. The IDE ports, however, are knocked back to ATA100 in relation to the i850E.

i845G
Intel "Extreme Graphics Architecture" integrated graphics are added to the i845E. The performance is nothing outstanding for the serious gamer or 3D modeller.

VIA

APOLLO P4X266
The first non-Intel chipset for the Pentium 4. Supports non-RAMBUS DDR memory and a frontside bus of 400MHz. 4GB of DDR RAM is supported, as well as PC133 SD RAM, ATA100 and six USB 1.1 ports.

The P4X266E adds a 533MHz FSB and support for the fastest Pentium 4s and Celerons. An improved AGP4x controller is thrown in, as are ATA133, USB 2.0 and FireWire.

The latest Apollo chipset from VIA, the P4X400, has an AGP8x controller and can take DDR333 RAM with a memory bus of up to 400MHz. Maximum memory is upped to a huge 32GB.

Labs Challenge





Tang
Extreme Gamer

Tang has a powerful GeForce4 Ti4600 from little-known board manufacturer Gainward. It's a company that often produces cards that outperform the competition. In this system, it's backed up with a Pentium 4 2.4GHz processor.

The Soltek SL-85DRV4 motherboard features the P4X266 chipset from VIA — outstanding for its time, although it has since been updated to the P4X333, and P4X400 in the SL-85ERV, supporting higher clocked memory. As such, the Extreme Gamer runs 512MB of older 266MHz (PC2100) DDR RAM. Nonetheless, this should still power the system to some favourable benchmarks. 10,006 3DMarks is a firm result that will ensure up-to-date game performance, though it strays behind machines with similar specs.

The same thing can be said of application performance, with a capable but not outstanding Winstone benchmark of 56.4. The lag can be put down to slower memory performance of the superseded P4X266 chipset.

In theory, the side panel of the case should unscrew easily, though in practice the entire panelling has to come off in order to scour the innards of the PC.

With its peripherals, the Extreme Gamer comes with a decent Samsung SyncMaster 17in flat CRT, proving a very popular choice across the megatest. The Genius mouse is a bit on the light side, but the keyboard is reasonable.

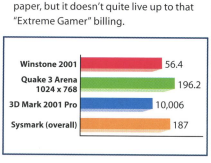
Sound is ordinary at best, with the Genius speakers connected to the OEM SoundBlaster Live! which can detract from an immersive gaming experience. This is a reasonable system, with solid specs on paper, but it doesn't quite live up to that "Extreme Gamer" billing.

Details >>

CPU Intel Pentium 4 2.4GHz
RAM 512MB PC2100 DDR
Graphics card Gainward GeForce4 Ti4600
Hard disk 80GB Western Digital Caviar
CD/DVD Pioneer 16x DVD, Sony 40x/12x/48x CD-RW
Audio Creative SoundBlaster Live!
Speakers Genius 320W
Monitor Samsung SyncMaster 753DFX 17in flat-CRT
OS Windows XP Home
Contact Tang Computers
Phone (08) 9444 6088
Online www.tang.com.au
Price $3,400

Verdict >>

Performance
Bang/buck
Features
Overall



CWS
GamePro 9020

As the name would suggest, the CWS Gamepro 9020 has been created with gaming firmly in mind: This machine is fast, but at $3,339 you would expect it to be even faster. All the components certainly look good in isolation, but when running as a unit, the benchmark results could have been better.

The inclusion of the Philips 15in LCD completely baffles us and could hardly be considered a die-hard gamer's viewing platform. The display is nice and sharp, but way too small. Output from the Leadtek GeForce4 Ti4600 video card pushed the system to a 3DMark 2001 score of 11,134, perfect for all the latest games.

Many gamers will cringe however when they hear that sound comes from an AC'97 chip onboard the MSI 6380E motherboard, though the inclusion of Altec Lansing AVS 5000 speakers will help soften the blow.

Plenty of room is assured with the Seagate ST380021A 80GB hard drive, which helped the system achieve a High-End Disk WinMark score of 15,200. A Winstone score of 59.1 also shows the Gamepro is equally at home doing office-related tasks.

The tower case, finished in silver, has plenty of room for extra drives and components, so upgraders are well looked after. A total of six USB ports are provided, two being USB 2.0. A Logitech wireless mouse and keyboard continue the quality feel of the Gamepro system.

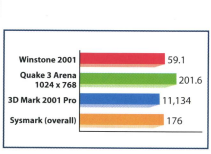
Still, for $3,339 we would have liked to have seen a few better components. A larger screen and a high-end sound card should have been achievable for the price, and would make this system a more attractive option.

Details >>

CPU AMD Athlon XP 2200+
RAM 512MB PC2700 DDR
Graphics card Leadtek G4 Ti4600 128MB
Hard disk 80GB Seagate Barracuda IV
CD/DVD 16x Sony DVD-ROM, 48x/12x/40x Sony CD-RW
Audio Integrated AC97
Speakers Altec Lansing AVS 5000
Monitor Philips 15in LCD
OS Windows XP Home
Contact CWS
Phone (02) 9519 2888
Online www.cwssydney.com.au
Price $3,339

Verdict >>

Performance
Bang/buck
Features
Overall




recommend
INSPIRE
Speakers
Sound
BLASTER
Extigy
The Impossible is Now Possible —
Stunning Digital Audio Fidelity
on Your Notebook
it's a Sound Blaster
Your notebook doesn't have to sound like a "tin can" when playing MP3s, Internet radio, CDs, DVDs, or games anymore! The Sound Blaster® Extigy™ makes stunning 24-bit audio playback and 100dB SNR (signal-to-noise ratio) clarity possible with any audio content making your notebook sound like a live performance! It comes packed with Creative's proprietary audio technologies like CMSS® which lets you listen to all your stereo content in rich 5.1 surround sound, as well as EAX® ADVANCED HD™ effects that allow you to personalize and enhance your music. Sound Blaster® Extigy™ can also be used with your desktop or Dolby Digital® compatible devices like gaming consoles and set top DVD players or audio devices like CD, MiniDisc or portable MP3 players.
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Creative Labs Pty Ltd
Unit 10 Discovery Cove 1801 Botany Rd,
Banksmeadow, NSW 2019
Tel: (02) 9666 6100 Fax: (02) 9666 6900
CREATIVE





Pioneer
Power

This was an intriguing entry. On the one hand there are outstanding features, such as the 128MB Creative Labs Radeon 9700 Pro. The 13,352 3DMarks that this system generated will ensure all those gaming features that were disabled — because of the hit on performance — come alive when you re-enable them and watch the Radeon 9700 chew through the frames.

Pioneer also shot for the fastest CPU available at the time of testing; the system employs an Intel Pentium 4 running at 2.8GHz. It's been fitted to the Gigabyte GA-8IEXP, a premium 845E chipset board, and makes use of the onboard IDE RAID by employing a twin disk mirroring system.

And Creative Labs' excellent Sound Blaster Live! DE 5.1 sound card is used to replace the motherboard's onboard sound, backed up by the Creative Inspire 5.1 speakers.

However when you approach the PC a simple two-button Logitech OEM mouse is provided, when it cries for a wheeled mouse.

Then there's the Hitachi monitor. Best described as a product at the value end of the quality spectrum, the most you'll squeeze out of it is 1,280 x 1,024 pixel resolution at a paltry 60Hz.

The case is nothing special to look at and the single DVD-ROM drive could do with a CD-RW accompanying it.

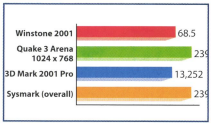
Speedy though it is, overall there are too many questions about this system to recommend it to anyone but an enthusiast who would be prepared to add the finishing touches.

Details >>

CPU Intel Pentium 4 2.8GHz
RAM 256MB PC2100 DDR
Graphics card Creative Radeon 9700 Pro 128MB
Hard disk 2 x 40GB IBM Deskstars
CD/DVD 16x LG DVD-ROM
Audio Creative Labs Sound Blaster Live! 5.1
Speakers Creative Inspire 5.1
Monitor Hitachi CM615
OS Windows XP Home
Contact Pioneer Computers
Phone (02) 9690 2888
Online
www.pioneercomputers.com.au
Price $3,399

Verdict >>

Performance
Bang/buck
Features
Overall



Also
Vogue Action Extreme 2400

This is Also Technology's top-of-the-range submission, and it looks the part. The slick brushed aluminium-esque chassis is set off with black trimmings in a stylish tower configuration. However, like the Vogue Extreme 2000, it's difficult to see who this machine is targeted at.

The tower size gives it the appearance of a full-featured desktop machine but bundled with it is the diminuitive Mitsubishi LCD monitor. Ideally, a screen this size is suited to a small office or reception desk. So why match a tower case with an itty-bitty screen?

The set of front-mounted USB ports is a good idea, although it would have been better if one of the ports wasn't dead on arrival. Inside the case is a fan at the front dangling precariously by one anchor point. Like the Vogue Extreme 200 PC, it's hard to see how the fan was dislodged as everything else, including the round cables, was spic-and-span.

The system is reliant on a number of vendors which Also has relationships with. For example, from Microstar comes the motherboard and graphics card; from Mitsubishi comes the monitor, CD-RW and modem. There's nothing wrong with this practice, but you could encounter limitations in customising your order.

The Vogue Extreme 2400 certainly failed to make an impact on any of the performance benchmarks. The GeForce-powered graphics managed a sweet 10,478 3DMarks.

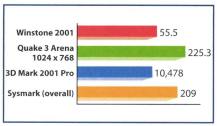
The Sysmark score — which is less dependent on graphical juice — was in the expected range for a Pentium 4 2.4GHz, with an overall mark of 209.

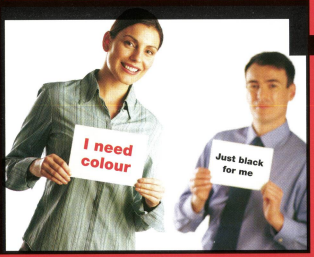
Details >>

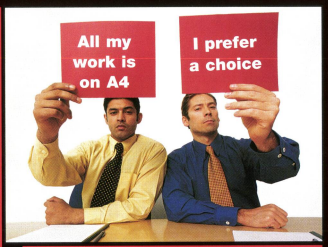
CPU Intel Pentium 4 2.4GHz
RAM 256MB PC2100 DDR
Graphics card Microstar GeForce4 Ti4200
Hard disk 40GB IBM Deskstar 60GXP
CD/DVD 48/40/12x Mitsubishi CD-RW
Audio Onboard AC97
Speakers Ultraview 325
Monitor Mitsubishi Diamond View DV158
OS Windows XP Professional
Contact Also Technology
Phone (02) 9519 4400
Online www.alsotech.com.au
Price $3,390

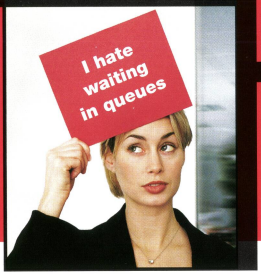
Verdict >>

Performance
Bang/buck
Features
Overall











C7200

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Plus Corp
Aspect T3

Basing the Aspect T3 on the Gigabyte GA-8IEXP is a top start for Plus Corp. The motherboard offers proven performance with a load of features, such as LAN port, an extra four USB 2.0 ports and three FireWire ports, mounted at the back. For extra connectivity Plus Corp added a PCI 56K modem.

The Pentium 4 2.4GHz processor has 512MB PC2700 DDR system memory in support. The Leadtek GeForce4 Ti4200 is a solid choice for some graphics muscle. Benchmark results were just as impressive as the specs suggest on paper, with an outstanding Business Winstone score of 67.6 and a respectable score of 10,155 3DMarks, making it a solid all-round performer that will handle office applications and current games.

Sony provides a quality CD-RW and DVD optical drive combination. Storage capacity is admirably addressed — a massive 160GB of hard drive space is on offer courtesy of two 80GB Maxtor Viper ATA 133 drives in RAID 0 configuration for extra disk performance.

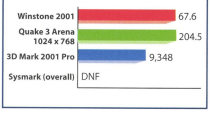
The Samsung 955DF 19in flat CRT is a good choice for visual output, offering plenty of screen real estate in a flat aperture grille format, displaying crisp and clear images.

Altech Lansing is a premium brand for PC speakers, but the 2.1 format is a compromise. The BTC Office keyboard is bristling with extra functions including a trackpoint mouse, though these could be dispensed with for a nice typing action.

Despite being housed in a desktop case, this machine is built well and has plenty of open space for airflow. Overall, the Aspect T3 is a dependable performer on all fronts.

Details >>

CPU Intel Pentium 4 2.4GHz
RAM 512MB PC2700 DDR
Graphics card Leadtek Winfast A250 LE TD Ti4200 128MB
Hard disk 2 x 80GB Maxtor Viper
CD/DVD Sony 16x DVD-ROM, Sony 48x/12x/40x CD-RW
Audio Realtek ALC650 5.1
Speakers Altech Lansing AVS 300 2.1
Monitor Samsung SyncMaster 955DF
OS Windows XP Home
Contact Plus Corporation
Phone 1800 007 587
Online www.pluscorp.com.au
Price $3,195



Verdict >>

Performance
Bang/buck
Features
Overall

Dell
Optiplex GX260

Presented in Dell's signature black, the Optiplex GX260 is a classic example of the corporate client PC, primed for large, company-wide rollouts and office productivity. Its desktop case is a fairly rare sight these days, but keeping all the components neatly together with the 15in LCD screen perched on top will suit the typical, space-conscious office environment.

Using an LCD is not only aesthetically appealing, it's also a boon for employees — the passive light is a lot easier on the eyes.

This particular GX260 comes with 256MB DDR-RAM running at 266MHz, and a Pentium 4 2GHz CPU and 40GB ATA 100 hard drive. Not the strongest specification, but just what's needed to fulfill its intended role.

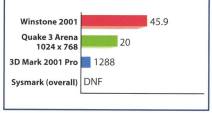
With a score of 45.2 in Winstone 2001 Business Disk, the Optiplex falls well behind most of the machines on test, though as a dedicated office clone it will perform as required. The Intel Extreme Graphics controller — simply the integrated graphics on the i845G chipset — is in part responsible for the slow result.

While Intel claims it supports multimedia and 3D graphics, actual performance (a low 1,372 3DMarks) tells a different story to the marketing hyperbole. Still, Dell uses premium components, can supply and support big rollouts and provide solid machines that will work without a hitch.

This machine supports gigabit networking, and provides on-board AC'97 sound with four USB ports and a 16x DVD drive. At $2,949, it's on the expensive side, though to some businesses it's worth the security and support offered by a big name brand. Just put some money aside for a speaker system, as Dell doesn't include one at this price.

Details >>

CPU Intel Pentium 4 2.0GHz
RAM 256MB PC2100 DDR
Graphics card Intel Extreme Graphics (i845 integrated graphics)
Hard disk 40GB Seagate Barracuda IV
CD/DVD Samsung 16x DVD-ROM/CD-RW Combo
Audio Onboard AC97
Speakers Internal
Monitor Dell 15in TFT
OS Windows 2000 or XP
Contact Dell
Phone 1300 303 107
Online www.dell.com.au
Price $2,949



Verdict >>

Performance
Bang/buck
Features
Overall

It just got even better...



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Stealth II S07

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16x DVD Rom Drive
40x12x48 CDRW
Integrated Video
Integrated Audio
Integrated 10/100 LAN
56k/V.90 PCI Fax/Modem
MS Windows XP Home OEM
Ability Office Suite 200
17" Samsung 753S (Black) Monitor
240Watt Speakers
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Stealth 2 Button Mouse
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$75 per Month*

Stealth II S14

Stealth Midi Tower
AMD Athlon™ XP 2100+ Processor
Gigabyte GA-7VAXP RAID M/B
256MB PC-2700 DDR SDRAM
40GB 7200rpm Hard Drive
16x DVD Rom Drive
40x12x48 CDRW
GeForce 2 MX400 64MB AGP
Integrated Audio
Integrated 10/100 LAN
56k/V.90 PCI Fax/Modem
MS Windows XP Home OEM
Ability Office Suite 2002
15" Samsung 151S TFT LCD Monitor
Altec Lansing 221 3 piece Speakers
Stealth Windows Keyboard
Stealth 2 Button Mouse
1 yr Limited National On Site Wty**
(Upgrade to 3 Yr Ltd On Site Wty for $175)

$2495

$107 per Month*

Stealth II S21

Stealth Midi Tower
AMD Athlon™ XP 2200+ Processor
Gigabyte GA-7VAXP RAID M/B
256MB PC-2700 DDR SDRAM
60GB 7200rpm Hard Drive
16x DVD Rom Drive
40x12x48 CDRW
GeForce 4 MX460 64MB VIVO AGP
Integrated Audio
Integrated 10/100 LAN
56k/V.90 PCI Fax/Modem
MS Windows XP Home OEM
Ability Office Suite 2002
17" Samsung 171S TFT LCD Monitor
Altec Lansing 321 3 Piece Speakers
Stealth Windows Keyboard
Stealth 2 Button Mouse
1 yr Limited National On Site Wty**
(Upgrade to 3 Yr Ltd On Site Wty for $175)

$3295

$141 per Month*

Stealth II S34

Stealth Midi Tower
AMD Athlon™ XP 2600+ Processor
Asus A7V8X Serial ATA RAID M/B
512MB PC-2700 DDR SDRAM
2 x 120GB Serial ATA Hard Drives
(Configurable as RAID 0 or 1)
16x DVD Rom Drive
48x12x48 CDRW
GeForce 4 Ti 4600 128MB VIVO AGP
Integrated Audio
Integrated 10/100 LAN
56k/V.90 PCI Fax/Modem
MS Windows XP Home OEM
Ability Office Suite 2002
19" Samsung 191T TFT LCD Monitor
Altec Lansing 251 5 Piece Speakers
Logitech Cordless Freedom Optical
1 yr Limited National On Site Wty**
(Upgrade to 3 Yr Ltd On Site Wty for $175)

$5795

$232 per Month*

AMD Athlon XP

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Labs Challenge





Beyond
Net Xtreme

The Net Xtreme's PC casing is dressed with a colour-coordinated theme, matching the slick metallic blue bezel of the solid Hercules 15in TFT screen. With standard midi-tower dimensions, the case is reasonably convincing in its style, hiding the optical bays under the blue front fascia without betraying the case's overall average quality.

The VIA P4X266 motherboard has been quickly superseded by the P4X333 and P4X400 models. But packing a Pentium 4 2.53GHz CPU, 512MB PC2700 DDR RAM (running at PC2100), and a Hercules Radeon 9000 with 128MB video RAM, the Net Xtreme has some stick behind it, posting an admirable 59.1 in Winstone Business Disk application tests.

Without a powerhouse nVidia GeForce Titanium card, or indeed the latest ATI Radeon 9700, 3D results are strong without being stellar — the Net Xtreme achieving 7,471 3DMarks. However, the Radeon 9000 has excellent features, like Video Immersion II for hardware DVD/MPEG-2 playback and de-interlacing, and is HDTV ready.

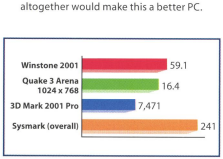
The Net Xtreme comes with a PCI modem, though broadband Internet users will have to supply their own network card. It also comes without a DVD drive, opting for a single Sony CD-RW. With DVD-friendly features, the omission is conspicuous by its absence.

Completing the quality Hercules set are the XPS210 speakers in 2.1 configuration, which offer reasonable sound, but without the surround sound of 5.1.

Capitalising on the Radeon's DVD features or going for a faster 3D card altogether would make this a better PC.

Details >>

CPU Intel Pentium 4 2.53GHz
RAM 512MB PC2700 DDR
Graphics card Hercules 3D Prophet 9000 Pro Radeon
Hard disk 60GB Maxtor Viper
CD/DVD Sony 40x/12x/40x CD-RW
Audio Onboard AC97
Speakers Hercules XPS210 2.1
Monitor Hercules Prophetview 720 15in TFT
OS Windows XP Home
Contact Beyond Computers
Phone 1300 1300 29
Online www.by.com.au
Price $2,888



Verdict >>

Performance
Bang/buck
Features
Overall

Hewlett-Packard
Pavilion 722a

Right out of the box you get the impression that the Pavilion 722a is a well-built, quality system. Aimed squarely at the SOHO market, it combines a good list of components, but the performance of the GeForce4 MX 420 video card drags the whole system down.

No less than six USB 2.0 ports adorn the Pavilion 722a, so the system is both a gadgeteer's delight and ready for the most demanding plug-and-play-fest.

The case is solid, completely tool-free and cuts out most sound from inside. An interesting inclusion is a CD storage bay at the top of the case, an ideal home for blank CDs to be used in the HP CD Rewriter.

Keyboard and mouse are wireless, but the mouse is very heavy and at times its movement is staggered.

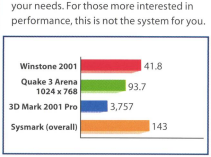
The specs indicate the Pavilion *should* be a capable machine, but benchmarking revealed a different story. With a 3DMark score of only 3,806, the Pavilion could hardly be considered a gamer's choice. The WinBench 99 High-End Disk Winmark score of only 10,600 is disappointing as well, showing that although the Samsung SV8004H is big at 80GB, it's also quite slow in practice.

Where Hewlett-Packard tries to put some runs on the board is with the included software and documentation. Fans of digital photos and editing are well represented with the My Photo Centre (a collection of image, photo and editing tools) and HP Memories Disc creator.

For those after a system that will easily endure beyond the warranty expiration date, the Pavilion 722a will certainly fulfill your needs. For those more interested in performance, this is not the system for you.

Details >>

CPU Intel Pentium 4 2.0GHz
RAM 256MB PC2100 DDR
Graphics card GeForce 4 MX420 32MB
Hard disk 80GB Samsung SV8004H
CD/DVD Mitsumi CR-48XATE CD-RW
Audio Onboard AC97
Speakers Polk Audio MM20
Monitor Hewlett Packard 17in
OS Windows XP Home
Contact Hewlett-Packard
Phone 13 23 47
Online www.hp.com.au
Price $2,599



Verdict >>

Performance
Bang/buck
Features
Overall



TPG XP Pro

The TPG XP Pro would struggle, in both performance and features, against some of the systems in the sub-$1,500 category. So what do you get for your $2,599? A relatively quick Intel Pentium 4 CPU at 2.4GHz, but a slow video adaptor, weak speakers and a case that won't win any style awards.

Graphics benchmarks were not kind. A score of 1,365 on 3DMark 2001 Pro, coupled with a Quake 3 Arena (1,024 x 768 at 32-bit) score of 37.4fps show this isn't a gamer's envy. The onboard Intel 82845G video adaptor cannot match the likes of a dedicated video card, such as the nVidia GeForce4 or ATI Radeon, though output to the TPG 770H 17in monitor showed promise, with a clear and richly coloured display.

Sound output from the onboard Avance AC'97 is through a drive bay speaker module. While this is convenient, the sound quality is at best shallow, and with the speakers set only 50mm apart, you would hardly call it a cinematic experience.

Even as an office system, the TPG XP Pro is slow. WinBench 99 results showed the system produced average results for running applications, though the Seagate ST340016A 40GB hard drive helped the XP Pro system achieve a more respectable 15500 for the High-End Disk WinMark benchmark.

Removing three screws allows entry into the ugly and chunky case. Inside there are three free PCI slots on the MSI MS-6526 motherboard, as well as an empty AGP slot, though there are no free drive bays.

Slow, pricey and ugly. Not exactly the words used to recommend a system. In fact, we can't think of any situation where you would be justified in spending the $2,599 asking price.

Details >>

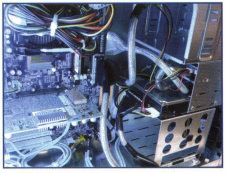
CPU Intel Pentium 4 2.4GHz
RAM 256MB PC2100 DDR
Graphics card Onboard Intel 8245G
Hard disk 40GB Seagate ST340016A
CD/DVD Diamond Data CDRW
Audio On board AC97
Speakers Drive Bay Speaker Module
Monitor TPG 770H 17in
OS Windows XP Pro
Contact TPG PC Systems
Phone (02) 9850 0800
Online www.pc.tpg.com.au
Price $2,599

Winstone 2001	DNF
Quake 3 Arena 1024 x 768	37.4
3D Mark 2001 Pro	1,365
Sysmark (overall)	DNF

Verdict >>

Performance
Bang/buck
Features
Overall

Cables, ports and drives



ROUNDED CABLES

On many of the high-end systems submitted for testing the manufacturers had gone to the trouble of fitting rounded cables to the storage devices — floppy drive, hard disks, DVD or CD drive. Traditional IDE cables are the flat ribbon type of multiple wire cable. Why is the rounded cable used?

One reason is simple aesthetics. If someone has gone to the trouble of cutout panels in their chassis, then they want to showcase the inside of their machine. Rounded cables help with this by clearing some of the clutter.

The other purpose is to improve the airflow inside the case. Rounded cables occupy less surface area than ribbon cables and promote better internal air circulation. Real gains are debatable but if you plan on tweaking up the machine in any way, think about investing in some rounded IDE cables (but be wary of dodgy rounded cables).

Some bargains are just that: nasty home-made jobs that introduce a lot of degraded signals.

FRONT-MOUNTED PORTS

USB stands for Universal Serial Bus, and right now the Universal part of its name holds true. USB in any one of its forms is the most commonly used and available expansion interface used in computers. So the more USB ports aboard a system the better.

APC likes them on the front of a PC, not tucked away on the back panel. If you have a digital camera, an MP3 player or almost any other USB device, then you don't want to have to dive behind the PC every time you need to connect (unless it's a permanent thing like a scanner).

And the ports have to be accessible. That is, they're not recessed so that a USB memory key can't squeeze in. So, for all sorts of reasons, front-mounted ports are the go.

COMBO DRIVES

Most modern PCs fit at least one optical drive. Some have two and in one case we saw, even three. The reason for manufacturers doubling or tripling up the drives is because multiple drives allow for more flexibility.

At the bottom end of the optical drive food chain is the humble CD-ROM. Or you can have a CD-RW that allows you to burn CDs, or a DVD-ROM that allows you to run DVDs, and lastly the DVD burner (whatever the flavour) that lets you do all of the above and burn DVDs.

Do away with the need for multiple drives by fitting a combo drive. The most common combo is a DVD-ROM/CD-RW. A DVD burner would be ideal but until the DVD camps work out a standard that is acceptable to people other than their interest group, steer clear of them.

$3,500–$4,999 systems

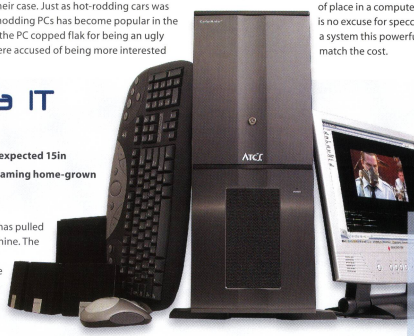
Neon lights, illuminated fans, Perspex panels. When you're spending nearly $5,000 on a system, performance isn't everything.

Anyone blowing five grand on a computer is either pretty passionate about their PCs, or encumbered with intensive processing requirements. In this category, computers are more of a luxury than a necessity, and people will often customise their case. Just as hot-rodding cars was popular in the '50s and '60s, modding PCs has become popular in the '90s and now. For a long time the PC copped flak for being an ugly beige box. System builders were accused of being more interested in function over form, but modern grunty PCs are frequently tweaked for the sake of appearance. In this price range, we begin to see some modded case designs, along with illuminated fans, and components bathed in a neon glow.

When you're spending almost $5,000 on a computer system, you expect all the parts to be top-notch before blowing money on making the case look pretty. Dual optical drives, large TFT panels and RAID hard disk configurations are all luxuries on a lower-spec system, but wouldn't be out of place in a computer with a $4,999 price tag. There is no excuse for speccing less than 512MB of RAM in a system this powerful, and the performance should match the cost.

Australia IT T5

Apart from the smaller than expected 15in monitor, this system is a screaming home-grown performer.



Melbourne-based Australia IT has pulled out all stops with this fine machine. The black Cooler Master case is an excellent choice for high-grade PCs — lots of quiet ventilation, easy-access side panel, big stabilising feet, and ample drive bays.

Inside, the Asus P4T533 motherboard has a Pentium 4 running at 2.8GHz with a 533MHz frontside bus. 512MB of 1066MHz RDRAM has been installed. When used in conjunction with the supplied Northwood P4 CPU, the RDRAM helps create an absolute fire breather. Upgrading will prove to be expensive as there are only two memory slots and they were both filled with 256MB sticks as standard.

apc EDITOR'S CHOICE NOV 2002

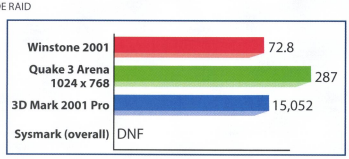
Additional features of the P4T533 board are six PCI slots, four onboard USB 2.0 ports and IDE RAID accommodated by two ATA133 channels. The two Western Digital hard disks are linked in a RAID 0 configuration to yield a whopping 160GB. Two ATA100 channels are available for CD-ROMs.

Asus has engineered a six-channel audio controller into the P4T533 that offers 5.1 channel surround-sound without the need for an extra card.

Benchmarking showed the T5 to be a screaming performer in the 3D stakes, cracking the 15,000 mark. It also returned outstanding results in WinBench Business Disk WinMark, which was 14,100. High-End Disk WinMark was 38,500.

For the price, we expected to receive a huge CRT screen. Instead, a rather understated Diamond View 15in TFT monitor was included with the test PC.

The limited resolution of 1,024 x 768 is not commensurate with the 3D designer/video editor-grade behemoth this really is.



Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB PC1066 RDRAM
Graphics card Power Color ATI Radeon 9700 Pro, 128MB RAM
Hard disk 2 x 80GB Western Digital Special Edition (RAID 0)
CD/DVD Sony 16x DVD-ROM, Sony 40x/12x/48x CD-RW
Audio Onboard Cmedia 6-channel.
Speakers Creative Inspire 5100
Monitor Mitsubishi Diamond View DV15B 15in TFT
OS Windows XP Professional
Contact Australia IT
Phone (03) 9543 5855
Online www.australiait.com.au
Price $4,999

Verdict >>

Performance
Bang/buck
Features
Overall



CWS
LuxuryPRO 6020

On the inside, the LuxuryPRO 6020 certainly holds a valid claim to first-class computing, brandishing a Pentium 4 2.6GHz processor, supported by the Intel 850EMV2 with an i850 chipset. There's also a whopping 768MB of RDRAM, which has taken a backseat to DDR, although it will outperform it in certain multimedia applications.

The Superpower case, however, is merely a cheap pretender in a blue and chrome disguise. It has the trappings of superior models — such as six hard disk bays and four optical drive bays — two of which are occupied by excellent Sony 16x DVD and 40x/12x/48x CD-RW drives.

The fascia discreetly hides the drives behind chrome-coloured covers, which, in theory, are supposed to flip open to reveal the drive tray. However, being made of cheap plastic, the cover of the top bay doesn't sit properly, causing the DVD to jam or even open and shut repeatedly, much to our bemusement.

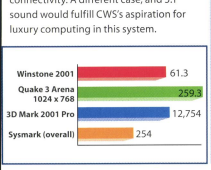
The rest of the LuxuryPRO 6020 fared well. In fact, it is peerless in its scorching 3DMark score of 12,745, spearheaded by the Leadtek GeForce4 Ti4600. Similarly, an overall score of 254 in Sysmark2002 is a top-notch result.

Hercules features strongly with this system, providing a vibrant 17in TFT display and decent XPS210 speakers, although it is disappointing that only 2.1 sound is supported via the onboard sound controller.

The Microsoft Internet keyboard and optical mouse are always solid inclusions, and PCI LAN and modem cards support connectivity. A different case, and 5.1 sound would fulfill CWS's aspiration for luxury computing in this system.

Details >>

CPU Intel Pentium4 2.6GHz
RAM 768MB PC800 RDRAM
Graphics card Leadtek A250 Ultra GeForce4 Ti4600 128MB
Hard disk 80GB Seagate Barracuda IV
CD/DVD Sony 16x DVD-ROM, Sony 40x/12x/48x CD-RW
Audio Onboard SoundMAX AD1885
Speakers Hercules XPS-210 2.1
Monitor Hercules 17in TFT
OS Windows XP Home
Contact CWS
Phone (02) 9519 2888
Online www.cwsydney.com.au
Price $4,999



Verdict >>

Performance
Bang/buck
Features
Overall



Marvel
Legend DVD

Sedate from the outside, inside the two-tone silver Legend DVD breathes a fiery 2.53GHz Pentium 4 CPU atop an EpoX EP-4BEAR motherboard. Add to this 512MB of PC2100 DDR RAM and you have the core components of a very quick machine.

Speed is second nature to the Legend DVD system, with two Western Digital WD800 80GB hard drives running together at RAID 0 (spanned), a High-End Disk WinMark of 57,600 shows waiting times are near non-existent. Impressive also is a Winstone of 70.1, plus a Sysymark of 312 showing the Legend DVD can charge through any tasks.

Though the 3DMark score of 10,671 wasn't the fastest on test, the Leadtek Winfast GeForce 4 Ti4600 video card is a very solid performer, with Quake 3 scores over 200fps at all resolutions. Viewing perfection is assured with the Sony 19in flat Trinitron monitor. Images are perfect, with bright vibrant colours, sharp lines and text. A lot of desktop space is needed, however, as its footprint is quite large.

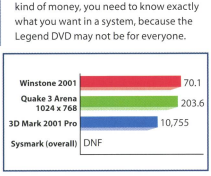
The inclusion of the DVD R/RW from Pioneer means optical storage won't be a problem, but also adds heavily to the system's price tag.

Thankfully, Marvel realised the onboard AC'97 sound was minor league and installed a Creative Labs SoundBlaster Audigy card. Coupled with the Creative Labs Inspire 5100 speakers, great sound output is achieved.

For a sub-$5,000 system, the Marvel Legend DVD represents fast, high quality computing. But if you're spending that kind of money, you need to know exactly what you want in a system, because the Legend DVD may not be for everyone.

Details >>

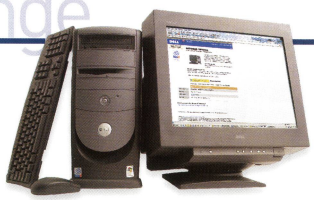
CPU Intel Pentium 4 2.53GHz
RAM 512MB PC2100 DDR
Graphics card Card Leadtek Winfast GeForce 4 Ti4600 128MB
Hard disk 2 x 80GB Western Digital Special Edition (RAID 0)
CD/DVD Pioneer DVR-A04 DVD-R
Audio Creative Labs SoundBlaster Audigy
Speakers Creative Inspire 5100
Monitor Sony CPD-G420
OS Windows XP Home
Contact Marvel Computers
Phone (02) 9680 9688
Online www.marvelcomputers.com.au
Price $4,995



Verdict >>

Performance
Bang/buck
Features
Overall





Plus Corp
Aspect T4

This is a solid effort but the Aspect T4 is held back by ordinary components. A pair of Athlon MP2100+ chips share the Tyan Tiger motherboard with a full gigabyte of DDR RAM filling two of the four memory slots. Yet in benchmark testing the T4 came out second best to an otherwise-similar single chip XP2100+ machine.

We decided to see how the T4 would fare for intensive and multithreaded 3D applications (such as AutoCAD, Lightwave, 3D Studio Max or Adobe Premiere), so we ran up a 3D Studio Max benchmark. This gave the T4 a slight edge, but — based on the processors or the price tag — it was nowhere near what you'd expect.

Perhaps it would be better with a cheaper single-CPU system and a beefier video adaptor. As good as they are for games, mainstream cards like the GeForce4 just don't cut it in the modelling and film editing world — we'd suggest an nVidia Quadro4 or ATI FireGL card in one of the 64-bit PCI slots.

Likewise, while consumers will appreciate the lush Samsung 17in TFT display, professionals still favour CRT for image quality and colour accuracy.

Two of the PCI slots are 64-bit, specifically designed for high-performance components cards such as RAID controllers and the aforementioned professional-level video cards.

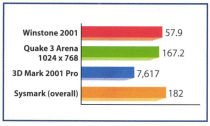
Three of the four 32-bit slots host the Sound Blaster Live! 5.1 channel audio card, Dynalink modem and three-port FireWire card. One more FireWire port graces the front panel, along with an extra two USB sockets.

Details >>

CPU Dual AMD Athlon MP 2100+
RAM 1024MB PC2100 DDR
Graphics card Leadtek Winfast GeForce4 A250 Ti4200 128MB ViVo
Hard disk 80GB Seagate Barracuda IV
CD/DVD Sony 16x DVD-ROM, Sony 40x/12x/48x CD-RW
Audio Creative Sound Blaster Live! DE 5.1 SE
Speakers Altec Lansing AVS 500
Monitor Samsung 17in 171S
OS Windows XP Professional
Contact Plus Corporation
Phone 1800 007 587
Online www.pluscorp.com.au
Price $4,995

Verdict >>

Performance
Bang/buck
Features
Overall



Dell
Dimension 8200

The Dell Dimension 8200 is very distinctive in its branded two-tone matte black and grey case, conveying an image of serious, heavy-duty performance.

Dell Dimension boxes are custom built; this system is fitted with a Dell i850 motherboard, supporting a 2.8GHz Pentium 4 processor complete with large exhaust scoop guiding air out the back, and 512MB PC800 RDRAM, an unbranded nVidia GeForce4 Ti4600 and PCI LAN and modem cards.

The IDE channels are mounted on their side, right on the edge of the board, placed to align perfectly with the awesome Western Digital 120GB ATA 100 hard drive, and the Philips DVD+RW, which will read, write and re-write both CD and DVD media (though when writing/re-writing use only +R or +RW DVDs).

The tool-less case is arranged this way to swing open on fixed hinges like a clamshell with the drives on one side, and core components on the other — excellent for working around inside.

As the specs and the looks suggest, the Dimension posted very strong benchmarks, with a huge 67.7 in Winstone application tests, as well as a formidable 3DMark score of 11,448. Visually, the Dimension 8200 is well catered for with the superb Trinitron 19in flat-CRT screen, ideal for high-resolution gaming and multimedia.

Unfortunately, sound-wise the system is somewhat lacking. While good quality components, the SoundBlaster Live! Value does not support 5.1 sound, and the Harmon Kardon 2.1 speakers are disappointingly small and underpowered.

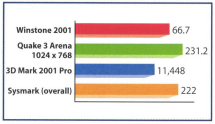
Sound aside, it's a solid full-featured system that will please those willing to pay the Dell premium.

Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB PC800 RDRAM
Graphics card nVidia GeForce4 Ti4600 128MB
Hard disk 120GB Western Digital Special Edition
CD/DVD Philips DVD+RW
Audio Creative SoundBlaster Live! Value
Speakers Harmon Kardon 695
Monitor Dell Trinitron 19in flat-CRT
OS Windows XP Home
Contact Dell
Phone 1300 303 107
Online www.dell.com.au
Price $4,799

Verdict >>

Performance
Bang/buck
Features
Overall





Aus PC Market
Blue Streak

Aus PC Market's Blue Streak is the junior sibling of The Thing from the $5,000 class, and it's cut from the same cloth. The Cooler Master case uses handy thumbscrews for the panelling and a hinged Perspex cover for the fascia, although this time around the chassis is ultra-cool brushed aluminium instead of café black.

The street cred continues with the Perspex window offering an enticing view of the awesome VIA P4PB motherboard, supporting USB 2.0 and FireWire (with ports mounted at the back) AGP 8X, and based on the powerful VIA P4X400 chipset.

A Pentium 4 2.4GHz CPU gives the Blue Streak life, with 256MB PC2700 DDR memory and a silver GeForce4 Ti4200 from Triplex. A blue neon tube highlights touches of quality handiwork, such as the clear plastic rounded IDE cables which connect the Maxtor 80GB ATA/133 hard drive, AOpen DVD and CD-RW drives to the system.

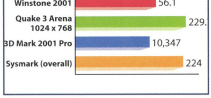
The 256MB of RAM and Ti4200 card pegged the benchmarks to 10,347 3Dmarks and 56.1 in Winstone Business. Not quite as fast as other machines on test, but by no means slow, and easily able to cope with the latest applications and games on the market.

The Blue Streak more than makes up for the minor performance deficit in style and quality with an array of slick peripherals, including a Samsung 17in TFT with silver bezel, Logitech cordless mouse and keyboard, as well as a set of black 5.1 Altech Lansing speakers.

In short, the Blue Streak is a comprehensive tech showpiece for the hardcore enthusiast.

Details >>

CPU Intel Pentium 4 2.4GHz
RAM 256MB PC2700 DDR
Graphics card Triplex Silver Millennium GeForce4 Ti4200
Hard disk 80GB Maxtor Viper
CD/DVD Asus 16x DVD-ROM, AOpen 40x/12x/40x CD-RW
Audio Onboard AC'97
Speakers Altec Lansing 251
Monitor Samsung SyncMaster 171s
OS Windows XP Professional
Contact Aus PC Market
Phone (02) 9817 2899
Online www.auspcmarket.com.au
Price $4,500



Verdict >>

Performance
Bang/buck
Features
Overall

Misses

CASE FAN LIGHTS

Case modding with cutout panels and neon interior lights are the first elements in the PC taking off as a fashion statement. Lights are cool, especially when they give that ethereal glow in a darkened room and you're playing a shooter in a maze . . . But case fan lights?

Two systems came with case fans that lit up when powered. The trouble was there was no cutout in the side of the chassis and the fans were rear facing. Now, you can't see the lights ordinarily and if they're deployed at the back of the machine, who is going to notice them? The spider nested in the jumble of cables at the back of the PC? We don't think so.

NOISY FANS

Cooling fans are now very much a part of modern-day PCs. There was a time when the only fan in a PC was the one on the power supply. Mac fans were aghast when after several generations of Macs, Apple decided the time had come for a cooling fan. Over time these modest cooling systems evolved so that now the CPU absolutely has to have one. And if you're looking to push the hardware that extra step, then additional interior cooling for improved airflow through the system, and special fans like hard drive coolers, are necessary.

All of which raises the level of acoustic noise. Some PCs have unacceptable levels of noise. Plus Corporation's Aspect T4, Aus PC Market's The Thing, Also's Vogue Extreme 2000 and Australia IT's S2 are all guilty. It's an aesthetic and environmental health issue and all manufacturers should work on keeping the noise levels down.

QUALITY OR SIZE?

The monitors submitted in the round-up varied enormously in size, weight, character and quality. We'll talk about the various monitor properties in next month's *APC* when we tackle 19in CRTs in our Labs Challenge, but with some systems there seemed to be opposing forces at play when you look at the monitor against the rest of the system. Several systems came with 19in behemoths. They're big, typically cranking up to a maximum of at least 1,600 x 1,200 pixels, but are they worth it?

For a good 19in CRT display the answer is undoubtedly. But too many opted for poor 19in monitors. The consensus is if you have to cost the difference between a good 17in display and an ordinary 19in one, go for quality over quantity. A tight 1,280 x 1,024 pixels on a 17in display is healthier on the eyes than a misconverged, flickery 1,600 x 1,200 display on a 19in CRT.





Also
Vogue Extreme 2000

Just who this $4,000-plus PC is targeted at is a mystery. There is nothing to distinguish this machine from its competition.

The Vogue Extreme appeared to be a typical clone PC with a very generous software bundle, but the graphical benchmark scores proved to be appalling. For example, a 3D Mark 2001 Pro score of 2,109 (unheard of for a GeForce4 Ti4600 card) and 36fps in Quake 3 at 1,024 x 768 resolution. How was this possible? Well, all was revealed when we inspected the inside.

Somehow in transit the Microstar GeForce4 Ti4600 card had shaken its onboard cooling heat sink and fan off its mounting atop the GeForce chip. While it was stable during testing, the poor graphics card was struggling with a fever.

New buyers beware. No-one is accusing anyone of negligence although it's hard to imagine, judging by the neatness of the interior, how the fan could have worked itself off its mountings. Because it showed no signs of instability a new user could work away with the graphics card in such a state, ignorant of the potential damage inside the case.

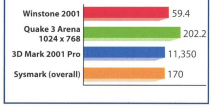
This is something that definitely should have been checked before sending the machine out for review. Supplying a new system to a customer in this state would be unacceptable.

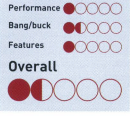
You have to question the inclusion of a DVD-RAM drive, too. The writable DVD market is a dog's breakfast at the moment because of competing standards. Whichever standard wins, one thing is for certain, it ain't gonna be DVD-RAM.

Details >>

CPU AMD Athlon XP 2000+
RAM 256MB PC2700 DDR
Graphics card Microstar GeForce4 Ti4600 128MB
Hard disk 80GB Maxtor DiamondMax Plus D740X
CD/DVD Panasonic LF-D321 DVD-RAM, Panasonic 40x/10x/24x CD-RW
Audio Onboard AC97
Speakers Ultraview JHT324
Monitor Mitsubishi Diamond View DV181
OS Windows XP Professional
Contact Also Technology
Phone (02) 9519 4600
Online www.alsotech.com.au
Price $4,199

Verdict >>





Boost
Boom Sonic

Adelaide's Boost Computers has gone all out to create a strong first impression — as demonstrated by the silver GeForce4 Ti4600 and the über-cool Triplex case — for its Boost Power Pack 2.

The heart of this PC is a Pentium 4 2.53GHz CPU, aided by 512MB of 333MHz DDR RAM. Gigabyte's latest range of motherboards has been the pick of the bunch in recent months, and the Boost 2's inclusion of the GA-8IEXP shows why. The system clocked 68.7 in Winstone and an impressive 11,687 in 3DMark.

Storage comes from a Promise IDE ATA 133 RAID controller and two 60GB Maxtor ATA 133 hard disks in striped mode (RAID 0). The board also supports six USB 2.0 ports, two of which Boost has sensibly routed to the front of the case, although the trio of FireWire ports remain inconveniently tucked away on the rear panel.

Boost has also chosen Lite-On optical drives, with the CD-RW unofficially supporting the backup of copy-protected disks.

However, Boost has forgone the onboard sound in favour of the SoundBlaster Audigy, combined with Hercules XPS510 5.1 surround speakers for serious output.

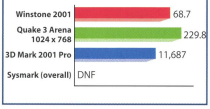
Visually, a 19in flat-CRT is the right idea, although the Viewmaster isn't the best example on the market. Apart from this minor negative, everything else about this system is good, with Logitech cordless mouse and keyboard combination the icing on the cake.

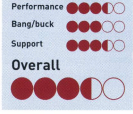
While it looks a little cluttered on the inside, Boost has put some thought and care into this machine.

Details >>

CPU Intel Pentium 4 2.53GHz
RAM 512MB PC2700 DDR
Graphics card Triplex Millennium Silver GeForce4 Ti4600 128MB
Hard disk 2 x 60GB Maxtor DiamondMax
CD/DVD Lite-On 16x DVD-ROM, Lite-On 40x/12x/48x CD-RW
Audio Creative Labs SoundBlaster Audigy
Speakers Hercules XPS510 5.1
Monitor Viewmaster 19in CRT
OS Windows XP Professional
Contact Boost Computers
Phone (08) 8410 2722
Online www.boostcomputers.com
Price $4,099

Verdict >>





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AMD Chipsets

AMD 760

Sometimes referred to as the 761 because of an update to DDR memory, this is now AMD's reference Athlon and Duron chipset with DDR200/266 memory and a memory bus rate of 2.1GB/s. Up to 4GB of registered DDR RAM can be installed since the addition of the AMD761 Northbridge. AGP4x is upgraded from the AGP2x of the AMD750, and the two IDE channels handle up to ATA100 drives.

The 760MP adds dual-CPU capability, but no groundbreaking updates. The 760MPX has 66MHz/64-bit PCI slots added for high-end cards like RAID controllers and serious graphics adaptors. Onboard AC97 audio controllers are supported too, which has prompted many manufacturers to include quality built-in sound for the masses.

VIA

VIA's Apollo range is probably the most popular chipset maker for AMD's Socket A processors, starting with the KT266. It's got AGP 4x, ATA100 and 200/266MHz frontside bus. 4GB of RAM is supported, as are onboard modem, Ethernet and 6-channel audio. Up to six USB 1.1 ports can be seen on KT266 boards. The KM266 integrates onboard video capabilities, with internal AGP 8x bandwidth. All other features are the same as the KT266.

Next in line is the KT333, offering DDR333 SD-RAM support in addition to the features already in the KT266. The top dog at the minute is the KT400, which strangely doesn't have a 400MHz FSB — although the name suggests that it does. However, memory bandwidth is stretched to 2.7GB/s and AGP 8x support is built in. ATA133 drives are catered for and six USB ports are supported across three controllers.

SIS

Another player in the AMD chipset stakes are SiS with their 745. The SiS745 supports onboard FireWire and DDR333 memory. All Athlon and Duron CPUs with an frontside bus of up to 266MHz can be used on a 745 board. 3GB of system memory can be installed; with a data rate of up to 2.7GB/s. 4x AGP video cards are supported, as well as onboard modem and audio controllers. Plenty of USB 1.1 ports are available (six) and ATA100 is standard. The attraction of the SiS745 is the lower cost, as the chipset is integrated into one chip as opposed to the North- and South-bridge configuration of other manufacturers.

It's worth mentioning that nVidia has also joined the fray with their nForce 420 chipset. It's basically the same as a KT266 or AMD760 in terms of regular features, but it includes an nVidia GPU which is purportedly similar in performance to a GeForce2 MX. Benchmark tests in WinBench and Sysymark showed performance on par with most similar boards, but when it comes to real 3D game tests, where the video controller's power is really taken to task, the results are disappointing. Suffice to say, it's nice to have the onboard graphics for little or no extra costs but it falls down when competing with top-shelf AGP cards.



AOpen Tube System

AOpen's unassumingly named Tube System doesn't look tubular at all; the name has been borrowed from the AOpen AX4b-533 motherboard inside, on which resides a single valve audio amplifier.

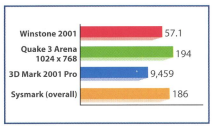
Yes, a valve on a motherboard! It holds a certain curio appeal but it's of questionable value to even the most avid sound buff (for more details see our review of this board on page 36). Plus, there are only three PCI slots and one of them is so close to the AGP slot that if it were populated it would give the video card no space to breathe.

The rest of the Tube System is par for the course. The popular 2.0GHz Pentium 4 is supported by 512MB of DDR memory. The sleek black case is of excellent build quality and houses two variable-speed ventilation fans, three available 5¼in drive bays and an AOpen CD-RW drive at the top, but no sign of a DVD player.

If you have a hankering for disk space beyond the 80GB Western Digital drive, there's room for three more. Front panel USB and audio ports are welcome features, as is the onboard LAN socket.

Predictably, AOpen has also taken care of the video department with a self-branded GeForce4 Ti4200 card. This produced an impressive 3DMark score of just fewer than 9,500 and Quake 3 ran at a tad under 200fps in 1,024 x 768 mode. Gamers and video editors will like those figures.

Top it all off with an attractive 1,024 x 768 pixel AOpen 15in LCD screen, and it's a solid system. However, it took some thought to find value in the Tube System, and even with the slick TFT screen the price is hard to justify.



Details >>

CPU Intel Pentuim 4 2.00Hz
RAM 512MB PC2100 DDR
Graphics card AOpen GF4 Ti4200, 128MB RAM
Hard disk 80GB Western Digital Special Edition
CD/DVD AOpen 40x/12x/48x CD-RW
Audio Onboard Vacuum Tube amplified sound card
Speakers AOpen Titanium with Subwoofer
Monitor AOpen F50LS 15in TFT
OS Windows XP Professional
Contact BlueChip Infotech
Phone (02) 8745 8433
Online www.bluechipit.com.au
Price $3,899

Verdict >>

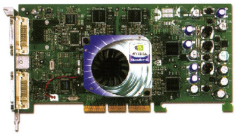
Performance
Bang/buck
Support
Overall

Leadtek
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Leadtek Quadro4 900 XGL

Ultimate workstation performance and feature





Leadtek Quadro4 900 XGL is the industry's most powerful and robust workstation graphics solution, easily surpassing the latest products on the market. The first product ever to exceed 100 in ProCDRS-03, the Quadro4 900 XGL represents a revolutionary combination of performance and features.

- Quadro4 900 XGL GPU
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- nfiniteFX II programmable graphics pipeline
- nView multi-display solution (VGA+VGA, DVI-I + DVI-I, VGA + DVI-I)

Quadro4 550 XGL

Fastest entry 3D workstation graphics performance





The Quadro4 550 XGL cards provide the fastest entry 3D graphics performance.The low-profile configurations combine the performance of 64MB of memoryand the flexibility of dual-analog or dual-digital displays for maximum onscreen real estate and productivity.

- Quadro4 550 XGL GPU
- 64MB 128-bit DDR-SDRAM
- nView multi-display solution (VGA+VGA, Digital+Digital)
- Small form factor

Quadro4 700 XGL

Optimal blend of price, performance and feature





Leadtek Quadro4 700 XGL cards offer the high-end features of the Quadro4 900 XGL at a more aggressive price for outstanding performance. Features include the programmability of NVIDIA's second generation nfiniteFX™II Engine, up to 64MB of fast DDR memory and the revolutionary nView multi-display solution.

- Quadro4 700 XGL GPU
- 64MB 128-bit DDR-SDRAM
- nfiniteFX II programmable graphics pipeline
- nView multi-display solution (VGA+VGA, VGA + DVI-I)

Quadro4 750 XGL

Optimal blend of price, performance and feature





Leadtek Quadro4 750 XGL cards offer the high-end features of the Quadro4 900 XGL at a more aggressive price for outstanding performance. Features include the programmability of NVIDIA's second generation nfiniteFX™II Engine, up to 128MB of fast DDR memory and the revolutionary nView multi-display solution.

- Quadro4 750 XGL GPU
- 128MB 128-bit DDR-SDRAM
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Labs Challenge





Emagen
Vitesse XP 2400+

Looking like a PC version of a Maserati, the gun metal grey Emagen Vitesse XP 2400+ system also has the performance to match. Under the hood is an Athlon XP 2400+ CPU paired to an Iwill KK400-RS motherboard, not a common choice but nonetheless a good solid performer.

The Gigabyte GV-R9700, based on the ATI Radeon 9700 chipset, didn't disappoint, with a 3DMark score of 12,245. Just like the CWS Gamepro however, we don't understand the inclusion of a 15in LCD, the Samsung 151S. A system like this needs to spread its wings, but can't on such a small viewing area.

A single black fascia AOpen CDRW4048 drive allows you to burn and reburn CDs and impressed us with its silent operation. Storage shouldn't be an issue either with the ATA133 Maxtor 6L080L4 80GB hard drive. This fast drive helped the system achieve a scorching 23,200 on High-End Disk WinMark. The 512MB DDR PC2700 RAM probably also has something to do with it.

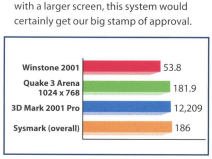
Once again, we question the use of the AC'97 as the sound provider. For your money you would expect a dedicated sound card, which poses less of a drain on the system. The Altec Lansing 251 speakers are however high class, and help sweeten the deal.

A totally tool-free case allows easy entry to the internals. Cross bars and panels are very sturdy, with three extraction fans keeping things cool. All components can be quickly and easily removed, with extra spare rails provided for future expansion.

If the 15in LCD monitor was replaced with a larger screen, this system would certainly get our big stamp of approval.

Details >>

CPU AMD Athlon XP 2400+
RAM 512MB PC2700 DDR
Graphics card Gigabyte GV-R9700 ATI Radeon 9700 128MB
Hard disk 80GBMaxtor DiamondMax
CD/DVD AOpen 48x/12x/40x CD-RW
Audio Onboard AC97
Speakers Altec lansing 251
Monitor Samsung 151S TFT
OS Windows XP Home
Contact Emagen
Phone 1300 880 070
Online www.emagen.com.au
Price $3,849



Verdict >>

Performance
Bang/buck
Support
Overall

Beyond
Power Xtreme

Beyond Computer's premium offering in this megatest is its 2.8GHz Pentium 4 Power Xtreme model. Positioned at the lower end of the $3,500 to $4,999 category, it represents very good value for a full-featured machine. However, while the case is undoubtedly striking, it could be dismissed as window dressing.

The first impression is of an aluminium chassis, but in fact the front face is plastic and the sides are steel. While this all looks smart, it's not very strong, nor is it made from a particularly heavy gauge. A hatch allows front-mounted audio and USB ports. The combo drive sits in the top bay and there are another three spare bays.

Like the Net Xtreme model, getting inside the case was a matter of some thumbscrews. The most noticeable issue was the heat inside. There were no case fans mounted and although cabling was reasonably neat, there was a lack of airflow.

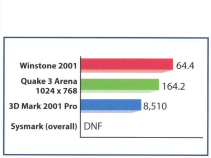
The Pentium 4 chip generates most of the heat but it felt warmer at the front of the case as a result of the hard drive. Also, warm to touch was the Leadtek AGP card with its hefty wraparound heat sink.

The Power Xtreme was a strong performer across all the benchmarks except 3DMark 2001. The GeForce4 Ti4400 AGP card should allow the system to score around 10,000 3DMarks, but this one hobbled to 8,510. Driver updates and tweaking didn't change the score.

This was the only odd result for this machine, as every other test was in its expected range.

Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB PC3200 DDR
Graphics card Leadtek Winfast A250 GeForce4 Ti4400 128MB
Hard disk 80GB Western Digital Special Edition
CD/DVD 16x/40x/32x10 LG DVD-ROM/CD-RW combo drive
Audio Creative Labs Sound Blaster Live! DE 5.1
Speakers Hercules XPS510
Monitor LG StudioWorks 900B
OS Windows XP Professional
Contact Beyond Computers
Phone 1300 130 029
Online www.by.com.au
Price $3,688



Verdict >>

Performance
Bang/buck
Features
Overall



Altech
Red Cyclone

When you're on to a good thing, stick to it. Altech has done just that with the Red Cyclone. Compared to the Blue Fusion PC, the system lives in a smaller yet no less robust miditower case. Thankfully, you can put away the screwdriver as this case features a simple tool-less lock mechanism to secure the side panels.

Inside we found familiar Altech terrain, starting with the Soltek SL-85ERV motherboard based on the strong P4X400 chipset from VIA. The new Pentium 4 2.8GHz processor with 512MB PC3200 DDR RAM commands the system, running at 333MHz (PC2700) — the standard spec of the motherboard.

Running the X-micro GeForce4 Ti4200 and SoundBlaster Live 5.1 for sound, the Red Cyclone is practically a carbon-copy of the Blue Fusion machine in the $2,500–$3,500 category.

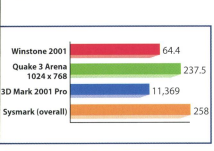
Not surprisingly, the Red Cyclone scored an identical 64.4 in Business Winstone 2001, and with 11,369 3DMarks, gaming performance is in the same ballpark. Altech has included a novel multi-coloured, lit 80mm extraction fan, and customarily employed rounded IDE cables to connect the identical AOpen CD-RW and Seagate 80GB hard drive, and the Sony branded DVD for slight contrast.

Unlike the Blue Fusion however, Altech has chosen the standard Intel CPU cooler. Peripherals feature a strong 19in Samsung flat-CRT, Microsoft wireless keyboard and mouse, and Creative 4.1 speaker combo.

In fact, only $110 separates this and the Blue Fusion in price — the case, CPU cooler, and DVD are the only notable differences.

Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB PC3200 DDR [running at 333MHz]
Graphics card X-Micro GeForce4 Ti4200 128MB
Hard disk 80GB Seagate Barracuda IV
CD/DVD Sony 16x DVD-ROM, AOpen 40x/12x/48x CD-RW
Audio Creative SoundBlaster Live! 5.1
Speakers Creative Inspire 4400 4.1
Monitor Samsung 19in SyncMaster 955DF
OS Windows XP Professional
Contact Altech Computers
Phone (02) 9748 2233
Online www.altech.com.au
Price $3,600



Verdict >>

Performance
Bang/buck
Support
Overall

Buyers beware

There are a number of things to keep in mind when searching for a new system to make sure your buying experience is a positive one.

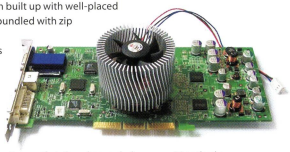
Ensure you get a full set of manuals, software and receipts when you buy your computer. *APC* has heard of vendors bundling pirate copies of Windows XP with new systems. A full set of manuals and software will be invaluable if you ever have to reinstall your computer from scratch.

Computer shops can blink in and out of existence within a few short months, in which case your warranty from the shop becomes useless. Try to buy from a shop with a proven track record and a good reputation. Talk to the vendor staff and judge them on their willingness to help you, as well as their technical proficiency. Turn your buzz-word filters up to 11 and don't be afraid to quiz them on motherboard and video chipsets, hard disk buffers and RAM speed. If you get the feeling that your salesperson doesn't know what they're talking about, move on to the next outlet.

We were extremely disappointed to see a couple of overclocked systems arrive in our labs for testing. Overclocking a CPU shortens its life and neither Intel nor AMD will honour the warranty of a chip fried by tweaking it beyond its capabilities. This is fine if you intentionally overclock your own system to eke out a few extra MHz as the shortened life of the processor is your responsibility. But to buy a new system in this state (and not be told of it) is quite simply unacceptable. When you pull the machine from the box and boot it for the first time, go into the BIOS and check the CPU clock frequency and frontside bus speed.

Check your manuals and confirm that you have the correct settings for your processor.

Don't be afraid to ask to look inside computers built by the shop. A system built up with well-placed cooling fans, cables bundled with zip ties, and use of rounded IDE cables is an obvious sign that the people in your computer shop know what they're doing.



Beware of retailers who overclock your new PC on the sly.

Have your say: APC's Service & Reliability survey
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you could win a copy of Photoshop Elements 2.0!
Adobe Photoshop Elements 2.0

$5,000 and over

Here are some of the fastest desktops on the block. They'll smash speed records and your credit card limit.

What good is a PC megatest without a few all-out über-machines to show just what can be done if you start out with a massive case and power supply and fill it up with high-end silicon goodies? In this price range, money is no object and performance reigns supreme.

Pulling the case off one of these behemoths is like going for a stroll down the aisles marked "exclusive" in your local PC shop. All the latest and greatest PC developments are built in. This means FireWire, USB 2.0, RAID and support for PC3200 DDR-SDRAM.

The hottest, biggest-ticket items this year are DVD burners and large TFT panels. And the current video card of choice is the ATI Radeon 9700. Machines that fall short of these targets cannot rightfully be called "drool-worthy". Likewise the hard disk. Gone are the days when SCSI provided significant performance improvements over IDE. The current performance leaders are the Western Digital Special Edition drives, which churn out blazingly fast benchmarks thanks to an 8MB data buffer.

Owning one of these machines will make you the envy of your mates and enable you to win the obsolescence war for a couple of years. In terms of raw performance, you can't do much better without moving to server architecture. If you're out to buy a new computer and price is of no consequence, read on . . .

Plus Corp
Aspect T5

A 2.4GHz Pentium 4 processor, 512MB of RDRAM and RAID support take this sleek and elegant package right to the top.



At the heart of the T5 is a Gigabyte GA-8IHXP, which boasts six PCI slots and RAMBUS memory support up to 2GB. It comes from Plus Corp with 512MB of RDRAM. The onboard Promise RAID controller chip supplies RAID 1 and 0 capabilities — the latter is employed to produce one fast 240GB drive from the twinned 120GB 7,200rpm Western Digital platters.

apc EDITOR'S CHOICE NOV 2002

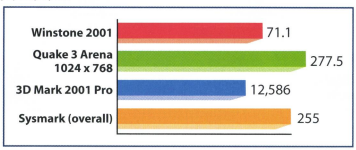
The imposing full tower case looks like a monolith from *2001: A Space Odyssey*, but is nowhere near as silent. When it's running the whole office is sure to hear the cooling fans. At least the 2.8GHz Pentium 4 and Western Digital drives aren't in danger of thermal meltdown, thanks to the wind tunnel effect. And you can always pump up the volume of the excellent set of Altec Lansing theatre speakers.

A Samsung 18in TFT just oozes style and its silver-grey bezel offsets the black case nicely (as do the black and grey accents of the cordless Logitech keyboard and optical mouse).

The monitor can handle resolutions as high as 1,600 x 1,200 and even has a pivoting display that permits portrait A4 page orientation.

For the added precision of digital display data the monitor also has DVI input. This connects to the DVI output of the Winfast GeForce4 Ti4600, with top results. 3DMark 2001 Pro returned a phenomenal 12,586 points, meaning it was one of the fastest graphics performers on test.

Two DVD drives are supplied, one of them a Pioneer DVR-A04 burner. In conjunction with the mammoth hard drive, Ulead VideoStudio 6 and ArcSoft Showbiz apps, this makes for a formidable home movie editing station.



Details >>

CPU Intel Pentium 4 2.8GHz
RAM 512MB Rambus PC1066 RDRAM
Graphics card Leadtek GeForce 4 A250 Ultra TD Ti4400 128 My Vivo
Hard disk 2x 120GB Western Digital Special Edition
CD/DVD Pioneer DVD-117 DVD-ROM, Pioneer DVR-A04 DVD-RW
Audio Onboard AC97 5.1
Speakers Altec Lansing 251
Monitor Samsung 181T 18in TFT
OS Windows XP Professional
Contact Plus Corp
Phone 1800 007 587
Online www.pluscorp.com.au
Price $7,395

Verdict >>

Performance
Bang/buck
Features
Overall



Marvel
Tornado XP 2400

There's absolutely no skimping here — the Tornado XP 2400 is a masterpiece of metal and silicon that is loaded with features. It comes with the highly acclaimed EPoX 8K5A3+ motherboard with the VIA KT333 chipset, supporting up to eight hard disks connected to the onboard Highpoint RAID controller, and up to four on the standard ATA133 IDE controller.

Marvel chose to enhance the Tornado's disk performance by using two RAID 0 configurations and splitting the amalgamated disks into four logical drives.

This system has no data redundancy but substantially increases data read/write speed, as proven by WinBench Business Disk scores 150% higher than most other systems in this megastest.

The four 80GB Western Digital drives with 8MB cache (all spinning at 7,200rpm) can be configured to suit your needs, whether they lean more toward speed and space requirements or data integrity.

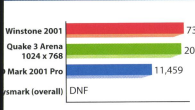
Sound is courtesy of the supplied Creative Audigy card and Inspire 5100 surround speaker system. There is also a high-speed Sony CD-RW drive, a DVD-ROM and the latest Pioneer A04 DVD-R/RW drive for disc-burning.

A perspex-sided miditower case — complete with internal Street Machine-style neon tube — beautifully complements the gorgeous 18in Sony TFT LCD screen. The Tornado has a super-fast XP 2400 CPU and a capable Winfast GeForce4 Ti4600, which scored close to 12,000 in the 3DMark 2001 Pro test.

This is an excellent games and graphics workstation.

Details >>

CPU AMD Athlon XP 2400+
RAM 512MB PC2700 DDR
Graphics card Leadtek Winfast GeForce 4 Ti4600 128MB
Hard disk 4x 80GB Western Digital Special Edition (RAID)
CD/DVD 16x Pioneer DVD-ROM, 40x/12x/48x Sony CD-RW
Audio Creative Labs SoundBlaster Audigy
Speakers Creative Inspire 5100
Monitor Sony SDM-S81
OS Windows XP Professional
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Online www.marvelcomputers.com.au
Price $7,595



Verdict >>

Performance
Bang/buck
Features
Overall



Altech
Blue Hurricane

Altech has opted for a Tyan Tiger dual Athlon motherboard playing host to a pair of Athlon MP2100+ processors, and built up from there. The Tiger is a solid, reliable AMD 760-based motherboard, and is a well cast engine block for a high-horsepower PC.

Half a gigabyte of quality Corsair DDR SDRAM also helps the machine in the performance stakes. That said, the Sydney-based company hasn't gone over the top with the component list, keeping the price in check and under $6,000. Most of the cost of the machine is sunk into the Sony DVD+RW drive and 18in Samsung TFT monitor.

To achieve the (vaguely) affordable price tag, Altech has skimped on a few parts that we'd consider vital for a powerhouse PC. Unfortunately the Blue Hurricane is crippled by a lesser graphics card, the GeForce4 Ti4200, and only achieved a score of 8,732 under 3DMark 2001 Pro.

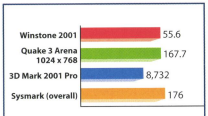
Likewise the hard disk. The Hurricane's single ultra-quiet 80GB Seagate Barracuda IV hard disk struggled to a lowly WinBench Business Disk score of 4,600. Thankfully the Maxtron server case's 480W Antec power supply will provide plenty of juice for when you want to add another couple of drives.

The raw processing performance of the dual CPUs is evident in the Sysmark score of 230 for Internet Content Creation, but, without a beefy graphics card or fast disk configuration, the Blue Hurricane never really reaches its full potential.

This is a zippy machine for processor-intensive tasks like rendering digital video, but it could use more hard disk space and a DV card.

Details >>

CPU Dual AMD Athlon MP2100+s
RAM 512MB PC2700 DDR
Graphics card X-Micro GeForce 4 Ti4200 128MB
Hard disk 80GB Seagate Barracuda IV
CD/DVD Sony DRU120A 8x/32x/10x/12x DVD+RW
Audio Creative SoundBlaster Audigy DE
Speakers Creative Inspire 4400
Monitor Samsung 181T 18in TFT
OS Windows XP Professional
Contact Altech Computers
Phone (02) 9748 2233
Online www.altech.com.au
Price $5,850



Verdict >>

Performance
Bang/buck
Support
Overall



Aus PC Market
The Thing

Bristling with this much muscle and dressed for effect, The Thing (yes, that's what they call it) is an eye-catching and indulgent piece of hardware.

The black Lian Li aluminium case is strong, lightweight and a good conductor for dissipating heat, with ample airflow through front to back ventilation slots and three fans to keep the warm air moving away from the innards.

There's even a vent cut into the top deck with a fan blowing outwards. Fortunately the elaborate cooling system doesn't add significantly to the noise level.

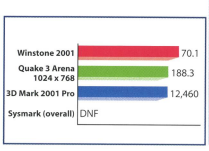
All this grunt is illuminated by a red neon light, which glows through a Perspex cutout on the left side. The motherboard is the Asus A7V8X, one of the first to support Serial ATA disk drives and AGP 8x. It uses VIA's long-awaited KT400 chipset and sports an Athlon XP 2200+ powerplant.

Yet for all that, The Thing falls short of its full potential. It really should have been fitted with an Athlon 2600+ and a Serial ATA drive, but even so, there's no apologising from this machine.

By far the most impressive aspect of The Thing is the addition of the Radeon 9700 Pro 8x AGP card. A 3DMark 2001 score of 12,460 3DMarks turned our heads and to prove it wasn't a fluke, it also managed to top our Winstone 2001 results with a score of 70.1.

Details >>

CPU AMD Athlon XP 2200+
RAM 512MB PC3200 DDR
Graphics card ATI Radeon 9700 Pro 128MB
Hard disk 120GB WD Caviar Special Edition
CD/DVD 16x AOpen DVD-ROM, 48x/12x/40x AOpen CD-RW
Audio Onboard AC97 5.1
Speakers Altec Lansing 251
Monitor Samsung SyncMaster 171s
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Verdict >>

Performance
Bang/buck
Features
Overall

Future-proof your machine

Clever buying choices you can make today that will help you out tomorrow.

The biggest mental stumbling block to upgrading your system is being willing to part with large quantities of cash for something that could well be cheaper in six weeks time.

Unfortunately you also know that in six weeks time, for as much money as you spend today, there could be something even better to buy. A faster chip, bigger hard disk, or better graphics card will be vying for your hard-earned. But it's not all doom and gloom. Choosing your parts carefully will ensure that the upgrade demons will be held at bay as long as possible.

MOTHERBOARD: THE MAIN FOCUS

As obvious as it sounds, your system's spinal column is where you should focus most attention. Not the CPU, not the graphics card, but the motherboard. If you select your motherboard judiciously, it should survive a couple of upgrades without becoming an Achilles heel. Buy the best board that you can within your budget. Look for systems that make use of the latest standards — like PC3200 DDR-SDRAM, USB 2.0, and if possible, Serial ATA.

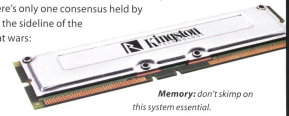
ATA133 is only being supported by Maxtor, so you needn't worry too much about having a chipset that makes use of it.

RAM: DON'T HOLD BACK

Also ensure that you buy the most RAM (of the highest quality) that you can. If you have a choice between PC2100, PC2700, PC3200, or even PC3500 DDR SDRAM, go with the fastest that your pocketbook allows. This will survive more upgrade cycles and serve you for a couple of years.

Avoid RDRAM like the plague. It's expensive and doesn't provide a significant performance benefit over some of the new, fast SDRAM.

The same can be said of optical drives. At the moment there are a number of DVD formats that are all doing battle for market supremacy. For this reason alone we recommend steering clear of DVD writers in general. If you do feel that you must own one today, don't touch DVD-RAM. There's only one consensus held by the viewers on the sideline of the ongoing format wars: and that's that DVD-RAM will not win.



***Memory:** don't skimp on this system essential.*

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Sony 16 x DVD Rom
Sony 17" CPD-E230 Trinitron Monitor
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Sony 40 x 12 x 48 CDRW Drive
Sony 16 x DVD Rom
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How we tested 56 desktop PCs

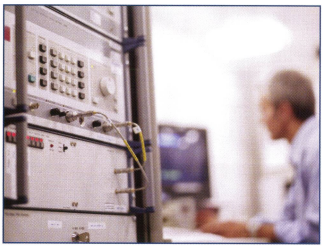
HOW WE SELECTED

There are a number of points to take into account when shopping for a new machine. For example, how much do you want to spend and what you intend to use your new PC for? However, even before considering these issues, shop credibility is vital. You have to be sure that the company you're buying from will be around to service your warranty before dropping any cash on a new machine.

This was the first step in our selection process — all of the companies that supplied systems for the PC megatest are either government endorsed or well known to *APC*.

Unfortunately some prominent computer suppliers, like Sydney-based Adelong, failed to deliver a machine for us to test, despite repeatedly assuring us that we'd receive a system.

The same goes for the companies like Metalbox, Compucon and Ipex, that were either unable or uninterested in sending a PC. With such fierce competition in the PC industry, you've got to wonder about any company that sits on its hands.



HOW WE TESTED

We ran a suite of benchmarks on the machines in *APC* Labs to test the performance, individual components and the overall system. We ran disk, bus, processor and graphics subsystem tests, including 3DMark 2001 SE, Quake 3, Sysmark2002, Winstone and WinBench 99 v2.0, on all the machines.

These benchmark scores formed the basis for our reviews, but of course, speed isn't everything. The quality of the components and how well the computer is built must also be taken into account. After all, what good is an extremely fast system if it's constantly falling over because of a poorly mounted CPU cooler or an unplugged case fan? (See our Benchmarking Workshop feature on page 146 for more information on how you can benchmark your PC.)

Each category had a price ceiling, so we judged each system next to competitors in the same price range. Each system started off with a flat score of three out of five for each category, which was adjusted according to how the machine scored in each of our fields. Points were added or subtracted based on a number of criteria. Points were awarded for well-built machines with bundled internal cables, well-seated fans and solid cases.

We looked for wise allocation of the money for components and awarded extra points for including brand-name parts like DVD-ROMs and CD-RWs. Front-mounted FireWire and USB 2.0 ports pushed scores up further.

Points were subtracted for systems entered with little case cooling, poor component selection, inadequate RAM or hard disk space, and low build quality. Of course, impressive benchmark results in a certain areas helped systems achieve a bonus, and this was again based on peer performance.

We treated value for money as the most important score, as this is the indicator most often used to buy a new machine. At any given price point in this megatest, you can pick up an awesome machine. Even the low end machines in the sub-$1,500 are powerful enough to carve through most processing tasks. It's an age-old cliché, but there really has never been a better time to buy.

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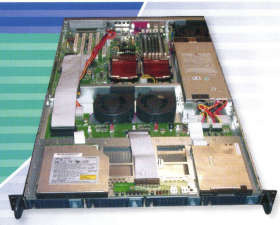
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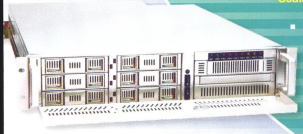
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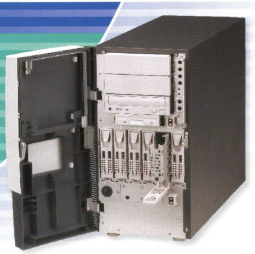
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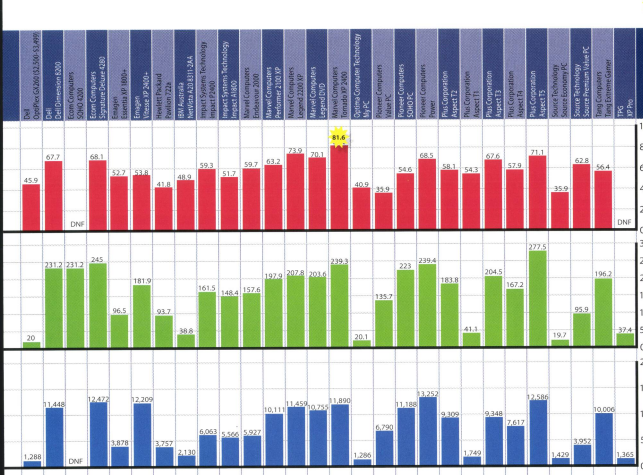
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Top score



Sysmark 2002																													
Internet Content Creation	DNF	105	258	339	184	225	262	256	301	183	210	DNF	DNF	DNF	278	156	292	346	215	203	298	239	360	189	311	274	DNF
Office Productivity	DNF	161	125	169	105	154	84	132	163	123	144	DNF	DNF	DNF	135	105	150	165	149	127	151	139	180	145	170	128	DNF
Quake III Arena																													
320 x 240	69.5	285.2	212	261.9	174.5	179.6	189.8	144.8	231	179.6	198.8	211.5	215.1	211.5	254.6	69.5	138.5	239.9	239.9	193.6	117.5	228.7	176.3	307.7	68.6	226.6	201.6	69.5	
1280 x 1024	11.8	186.6	DNF	216.1	58.6	175.7	DNF	22.4	98	DNF	111.6	163.6	173.8	163.8	191.7	9.8	123.6	177.4	228.1	DNF	DNF	DNF	DNF	DNF	10.5	58.5	170.3	19.9	
WinBench 99																													
Business Disk Winmark	8170	8,010	DNF	7,330	4,810	5,710	3,740	4,970	5,410	3,790	9030	10,700	12,500	10,700	24,600	3,240	4,480	5,790	6,910	4,800	4490	8,570	5,490	15,100	4,610	7,160	5,230	4,010	
High-End Disk Winmark	26,900	19,700	DNF	21,000	15,500	23,200	11,900	15,500	18,900	17,600	29,400	39,000	59,800	39,000	90,300	14,200	17,500	18,600	18,200	16,600	16,100	22,700	20,500	33,400	17,000	18,600	17,100	15,500	
Business Graphics Winmark	573	855	DNF	835	569	803	573	418	759	603	627	680	658	680	770	307	325	678	696	656	632	789	788	776	248	653	530	192	
High-End Graphics	1,070	5,880	DNF	1,650	1,290	1,620	1,160	990	1,340	1,180	1,340	1,420	1,270	1,420	1,890	963	688	1,790	1,800	1320	1,660	1,410	1,320	1830	739	1,310	1,080	1,365	
Viewperf 6.1.2																													
3dsmax-04	55.7	75.5	DNF	85.0	DNF	108.1	33.6	23.5	56.8	54.7	48.7	114.0	147.5	114.6	143.8	DNF	59.9	84.9	165.4	64.2	27.4	75.0	62.5	76.2	5.8	33.6	60.0	DNF	
DRV-07	15.7	33.7	DNF	26.8	DNF	12.9	16.6	7.5	23.8	18.3	19.0	25.1	27.1	25.2	25.3	DNF	16.4	26.2	18.6	23.0	11	24.1	16.4	36.2	1.7	17.4	18.2	DNF	
DX-06	20.4	31.4	DNF	29.1	DNF	29.2	21.3	9.0	27.1	27.1	27.7	40.1	45.2	40.1	42.6	DNF	21.3	35.7	42.2	34.8	14.8	30.1	29.6	37.2	2.8	26.6	24.5	DNF	
Light-04	3.7	12.2	DNF	9.6	DNF	7.3	7.2	5.2	8.3	7.5	8.3	9.01	9.8	9.01	9.7	DNF	7.2	8.4	10.9	9.4	5.95	9.6	8.4	13.5	1.7	7.9	7.7	DNF	
MedMCAD-01	17.8	27.7	DNF	30.1	DNF	20.8	12.1	9.9	23.8	22.3	20.2	30.4	32.5	30.4	31.9	DNF	16.8	28.0	35.8	24.5	10.4	23.7	23.7	28.1	5.2	13.0	21.4	DNF	
ProCDRS-03	12.4	19.9	DNF	27.0	DNF	13.9	9.2	15.9	17.3	16.2	15.4	25.3	30.9	25.3	31.4	DNF	21.4	26.4	28.5	21.3	9.3	21.4	21.1	26.4	2.0	9.4	23.4	DNF	

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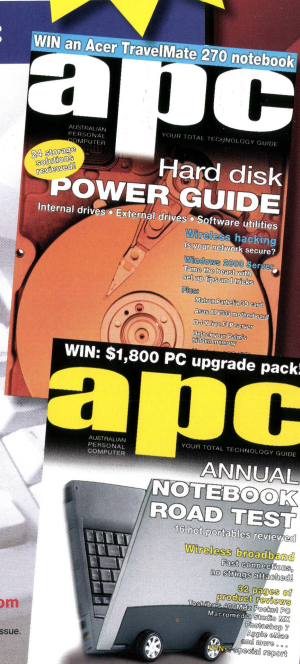
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Labs Challenge

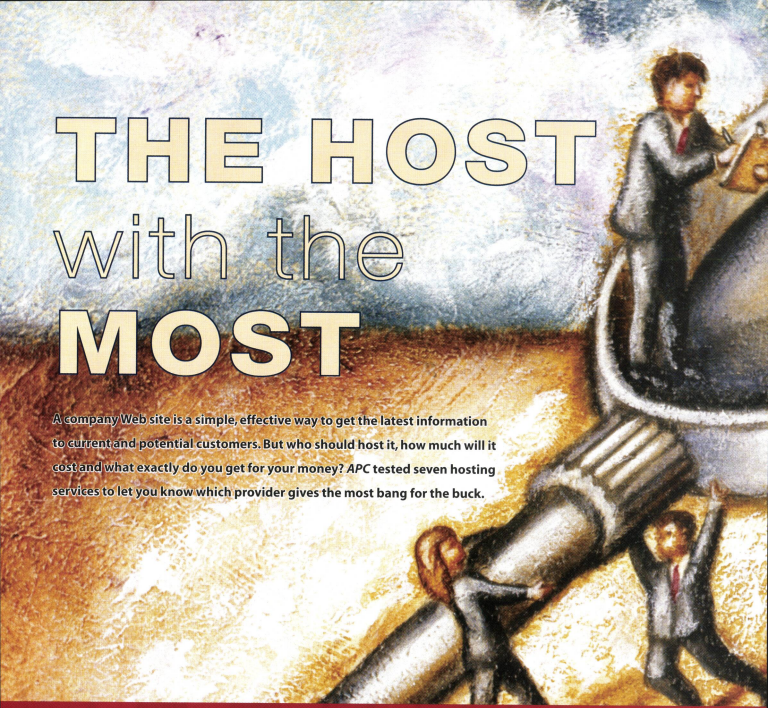
Company name Model name	Acer Aspire 6600	Acer Aspire 6000	Alto Technology Vogue Essential 1300	Alto Technology Vogue Action Extreme 2400	Alto Technology Vogue Extreme 3200	Altech Computers Viper XP	Altech Computers Silver Raid	Altech Computers Black Adder	Altech Computers Red Cyclone	Altech Computers Blue Hurricane	Aus PC Market Beast Break	Aus PC Market The Thing	Australia I.T. AIT E3 series
Price (RRP)	$2,499	$3,499	$1,349	$3,390	$4,199	$1,495	$2,280	$3,490	$3,600	$5,850	$4,500	$5,150	$1,499
Phone	1300 362 328	1300 362 328	02 9519 4600	02 9519 4600	02 9519 4600	02 9748 2233	02 9748 2233	02 9748 2233	02 9748 2233	02 9748 2233	02 9817 2899	02 9817 2899	03 9543 5855
Online	www.acer.com.au	www.acer.com.au	www.altotech.com.au	www.altotech.com.au	www.altotech.com.au	www.altech.com.au	www.altech.com.au	www.altech.com.au	www.altech.com.au	www.altech.com.au	www.auspcmarket.com.au	www.auspcmarket.com.au	www.aitretail.com.au
Processor	Pentium 4 2.8GHz	Pentium 4 2.8GHz	Duron 1.3 GHz	Pentium 4 2.4GHz	Athlon XP 2000+	Athlon XP 2000+	Pentium 4 2.53GHz	Pentium 4 2.8GHz	Pentium 4 2.2GHz	2 x Athlon MP 2100+	Pentium 4 2.4GHz	Athlon XP 2200+	Athlon XP 2900+
RAM	512 MB DDR	512 MB DDR	256MB DDR	256MB DDR	512MB DDR	256MB DDR	256MB DDR	512MB DDR	512MB DDR	512MB DDR	256MB DDR	512MB DDR	256MB DDR
Motherboard	Acer J86M	Acer J86M	Microstar MS 6390ML	Microstar K74 Ultra	Microstar K74 Ultra	Soltek SL-75DRV5	Soltek SL-85ERV	Soltek SL-85ERV	Soltek SL-85ERV	Tyan Tiger MP	VIA P4PE	Asus A7V8X	Asus A7S333
Hard disk	80GB Seagate Barracuda IV	120GB Maxtor 6Y120 P0 D540X	30GB Maxtor Ares	40GB IBM Desktar 40GXP	80GB Mastor Diamond-Max	40GB Seagate Barracuda IV	80GB Seagate Barracuda IV	80GB Seagate Barracuda IV	80GB Seagate Barracuda IV	80GB Seagate Barracuda IV	80GB Maxtor Viper	120GB Western Digital Special Ed.	40GB IBM Desktar 120GXP
Optical Drive	16x Pioneer DVD-ROM, 40x Lite-On CD-RW	16x Pioneer DVD-ROM, 40x Lite-On CD-RW	Panasonic DVD/CD-RW Combo	48x/40x/12x Mitsubishi CD-RW	Panasonic DVD-RAM, 40x/24x/10x Panasonic CD-RW	32x/12x/40x Lite-On CD-RW	40x/12x/48x AOpen CD-RW	16x AOpen DVD-ROM, 40x/12x/48x AOpen CD-RW	16x Sony DVD-ROM, AOpen CD-RW	8x/32x/ 10x 12x Sony DVD+RW	16x AOpen DVD-ROM, 40x/16x/48x Asus CD-RW	16x AOpen DVD-ROM, 40x/12x/40x AOpen CD-RW	54x Mitsumi CD-ROM
Display Adaptor	GeForce4 Ti4200 64MB	GeForce4 Ti4400 128MB	Onboard	Microstar GeForce4 Ti4200 128MB	Microstar GeForce 4 Ti 4600 128MB	X-Micro GeForce4 MX440 64MB	X-Micro GeForce4 Ti4200 128MB	X-Micro GeForce4 Ti4200 128MB	X-Micro GeForce4 Ti4200 128MB	X-Micro GeForce4 Ti4200 128MB	Triplex GeForce4 Ti4200 64MB	ATI Radeon 9700 Pro 128MB	Sparkle Ti200 128MB GF3
Monitor	Acer 711 17in CRT	Acer 901 19in CRT	Ultra View 17in CRT	Mitsubishi DV15B 15in TFT	Mitsubishi DV181 18in TFT	Samtron 76E 17in CRT	Samsung SyncMaster 753DF+ 17in CRT	Samsung SyncMaster 955DF 19in CRT	Samsung SyncMaster 955DF 19in CRT	Samsung SyncMaster 181T 18in TFT	Samsung SyncMaster 171S 17in TFT	Samsung SyncMaster 171S 17in TFT	Samsung SyncMaster 753S 17in CRT
Sound Card	Onboard	Creative Sound Blaster Audigy	Onboard	Onboard	Onboard	Onboard	Onboard	Sound Blaster Live! 5.1	Sound Blaster Live! 5.1	Creative Labs Sound Blaster Audigy OE 5.1	Onboard	Onboard	Onboard
Audio Support	Stereo	5.1	Stereo	Stereo	5.1	Stereo	5.1	5.1	5.1	5.1	5.1	5.1	5.1
OS	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Professional	Windows XP Professional	Windows XP Professional	Windows XP Professional	Windows XP Home
Warranty (return to base, unless otherwise indicated)	1 Year Onsite	1 Year Onsite	2 Years	2 Years	2 Years	2 Years	2 Years	2 Years Onsite	3 Years Onsite	2 Years Onsite	2 Years	2 Years	2 Years
Performance	3	2.5	2	3	1	3	3	4	3.5	3.5	3	4	3
Bang For Buck	3	3	3	3	1.5	4.5	3	4	3.5	3.5	3	4	4
Features	3	4	2.5	3	1	3.5	3	4	3	3.5	4	4	3
Overall	3	3	2.5	3	1.5	4	3	4	3.5	3.5	3.5	4	3.5

	Australia I.T. AIT M2 series	Australia I.T. AIT M3 Series	Australia I.T. AIT T5 Series	Beyond Computers Beyond Power Xtreme	Beyond Computers Beyond Power Xtreme	Bitechlip Infotech AQpen Tube System	Boost Computers Boom Sonic	Boost Computers Bueno	Britec Computers Business	Britec Computers Home	Computer Warehouse Sydney Gamer Pro 9020	Computer Warehouse Sydney Gamer Pro 9020	Computer Warehouse Sydney Luxury Pro 9020	Computer Warehouse Sydney Luxury Pro 9020	Dell OptiPlex GX260
	$2,499	$3,499	$4,999	$2,888	$3,668	$3,899	$4,099	$2,249	$1,450	$2,490	$1,499	$2,479	$3,399	$4,999	$1,990
	03 9543 5855	03 9543 5855	03 9543 5855	1300 1300 29	1300 1300 29	02 8745 8433	08 8410 2722	08 8410 2722	03 5940 1698	03 5940 1698	02 9519 2888	02 9519 2888	02 9519 2888	02 9519 2888	1300 303 107
	www.australiait.com.au	www.australiait.com.au	www.australiait.com.au	www.by.com.au	www.by.com.au	www.aerocn.com.au	www.boostcomputers.com	www.boostcomputers.com	www.britec.biz	www.britec.biz	www.computersydney.com.au	www.computersydney.com.au	www.computersydney.com.au	www.computersydney.com.au	www.dell.com.au
	Athlon XP 2200+	Athlon XP 2200+	Pentium 4 2.8GHz	Pentium 4 2.53GHz	Pentium 4 2.8GHz	Pentium 4 2.0GHz	Pentium 4 2.53GHz	Athlon XP 2000+	Celeron 1.7GHz	Pentium 4 2.4GHz	Duron 1.3GHz	Pentium 4 2.4GHz	Athlon XP 2200+	Pentium 4 2.8GHz	Pentium 4 2.0GHz
	512MB DDR	512MB DDR	512MB RDRAM	512MB DDR	512MB DDR	512MB DDR	512MB DDR	256MB DDR	256MB DDR	256Mb DDR	384MB DDR	768MB DDR	512MB DDR	768MB RDRAM	128MB DDR
	Asus A7V333	ASUS A7V8X	ASUS P4T533	VIA P4PB 266E	VIA P4X400A	AOpen AX4B-533 Tube	Gigabyte GA-8IEXP	Gigabyte GA-7VRXP	Gigabyte GA-8IE	Gigabyte GA-8IEXP	Gigabyte GA-7IDXE	Gigabyte GA-8IE	MSI KT3 Ultra2	Intel D850EMV2	Dell-branded
	60GB IBM Deskstar 120GXP	80GB Western Digital Caviar	2 x 80GB Western Digital Caviar	60GB Maxtor Vipet	80GB Western Digital Caviar	80GB Western Digital Caviar	2 x 60GB Maxtor Diamond-Max	60GB Western Digital Caviar	40GB Seagate Barracuda IV	80GB Westan Digital	40GB Seagate Barracuda IV	60GB Seagate Barracuda IV	80GB Seagate Barracuda IV	80GB Seagate Barracuda IV	20GB Seagate Barracuda IV
	16x Sony DVD-ROM, 40x/12x/48x Sony CD-RW	16x AOpen DVD-ROM, 40x/12x/48x Sony CD-RW	6x Sony DVD-ROM, 40x/12x/48x Sony CD-RW	40x/12x/40x Sony CD-RW	16x/40x/32x/10x LG DVD-ROM/CD-RW combo	40x/12x/48x AOpen CD-RW	40x/12x/48x Lite-On CD-RW, 16x LiteOn DVD-ROM	40x/12x/48x Lite-On CD-RW	52x Lite-On CD-ROM	16x Lite-On DVD-ROM, 48x/12x/48x Lite-On CD-RW	48x/40x/12x BenQ CD-RW	48x/40x/12x BenQ CD-RW	48x/12x/40x Sony CD-RW, 16x Sony DVD-ROM	48x/40x/12x Sony CD-RW, 16x Sony DVD-ROM	Samsung SM-303B DVD-ROM/ CD-RW combo
	Sparkle TI4600 128MB Platinum Edition GF4	Power Color ATI Radeon 9700 Pro 128MB	Power Color ATI Radeon 9700 Pro 128MB	Hercules 3D Prophet 9000 Pro 128MB	Leadtek Winfast A250 GeForce4 Ti4400 128MB	AOpen GeForce4 Ti4200 128MB	Triplex GeForce4 Ti4600 128MB	Triplex Millenium Silver Ti4200 64MB	Gigabyte GA-A9x45-H Radeon 7500 Pro 64MB	Abit Siluro GeForce4 Ti4200 64MB	Eagle GeForce4 MX460 128MB	Leadtek GeForce4 Ti4200 128MB	Leadtek Winfast A250 GeForce Ti4600 128MB	Leadtek GeForce4 Ti4600 128MB	Onboard
	Samsung SyncMaster 753DFX 17in CRT	Samsung SyncMaster 753DFX 17in CRT	Mitsubishi DVT58 18in TFT	Hercules Prophet view720 15in TFT	LG Studio-Works 910B 19in CRT	AOpen F50LS 15in TFT	Viewmaster 19in CRT	Likom Tap 76 19in CRT	Hyundai V770 17in CRT	Hyundai Q770 17in CRT	Viewsonic E70 17in CRT	Viewsonic E70 17in CRT	Philips 105E 15in TFT	Hercules Prophet View 920 17in TFT	Dell 150JFP 15in TFT
	Onboard	Onboard	Onboard	Onboard	Creative Labs Sound Blaster Live! DE5.1	Onboard Tube sound	Creative Sound Blaster Audigy	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard
	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	Stereo	5.1	5.1	Stereo	Stereo
	Windows XP Home	Windows XP Professional	Windows XP Professional	Windows XP Home	Windows XP Professional	Windows XP Professional	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Home	Windows XP Home	Windows 2000 Pro or XP
	2 Years	2 Years	2 Years	2 Years	2 Years	3 Years	3 Years Onsite	3 Years Onsite	2 Years	2 Years	1 Year	1 Year	1 Year	1 Year	2 Years
	4	4	5	3.5	2.5	3	3.5	3.5	3	3.5	2.5	3.5	3	4	1
	4	3	4.5	3.5	3	3	3	2.5	3	3.5	4	3	3.5	3	2
	4.5	5	3.5	3	2	3.5	2.5	3	3	3	3	3	3	3	3
	4	3.5	4.5	3.5	2.5	2.5	3.5	3	3	3.5	3	3	3	3.5	2

Labs Challenge

Company name Model name	Dell OptiPlex GX260	Dell Dimension 8300	Ecom Computers SKMS A2010	Ecom Computers Signature Deluxe A280	Emagen Essential XP 1800+	Emagen Ultrase XP 2400+	Hewlett Packard Pavilion 722a	IBM Australia NetVista A30 8811-2AA	Impact Systems Technology Impact A1800	Impact Systems Technology Impact A1450	Marvel Computers Enterprise 2000	Marvel Computers Performer 2100 XP	Marvel Computers Legend 2200 XP
Price (RRP inc. GST)	$2,949	$4,799	$1,499	$3,499	$1,499	$3,849	$2,599	$2,358	$2,450	$3,450	$1,495	$2,495	$3,495
Phone	1300 303 107	1300 303 107	02 9299 0022	02 9299 0022	1300 880 070	1300 880 070	13 23 47	1800 289 426	02 9621 2999	02 9621 2999	02 9680 9688	02 9680 9688	02 9680 9688
Online	www.dell.com.au	www.dell.com.au	www.ecomcomputers.com.au	www.ecomcomputers.com.au	www.emagen.com.au	www.emagen.com.au	www.hp.com.au	www.ibm.com.au	www.impactsystems.com.au	www.impactsystems.com.au	www.marvelcomputers.com.au	www.marvelcomputers.com.au	www.marvelcomputers.com.au
Processor	Pentium 4 2.0GHz	Pentium 4 2.8GHz	Pentium 4 2.0GHz	Pentium 4 2.8GHz	Athlon XP 1800+	Athlon XP 2400+	Pentium 4 2.0GHz	Pentium 4 2.0GHz	Athlon XP 1600+	Pentium 4 2.4GHz	Athlon XP 2000+	Athlon XP 2100+	Athlon XP 2200+
RAM	256MB DDR	512MB RDRAM	256MB DDR	512MB DDR	256MB DDR	512MB DDR	256MB DDR	256MB DDR	256MB DDR	512MB DDR	256MB DDR	256MB DDR	512MB DDR
Motherboard	Dell-branded	Dell-branded	Gigabyte GA-8IEXP	Gigabyte GA-7KVMP	Iwill KK400-RS	generic Intel 845G	Gigabyte-branded	Gigabyte GA-7VRXP	Intel D845EBG2	Gigabyte GA-7VRX	Epox 8K4A2	Epox 8K5A2+	Epox 8K5A2+
Hard disk	40GB Seagate Barracuda IV	Western Digital SE 120GB	60GB Seagate U series	60GB Seagate Barracuda IV	40GB Maxtor Viper	80GB Maxtor Viper	80GB Samsung SpinPoint P40	40GB IBM Deskstar 120GXP	40GB IBM Deskstar	60GB IBM Deskstar 60GXP	80GB Seagate Barracuda IV	80GB Western Digital Caviar	2 x 80GB Western Digital Caviar (spanned)
Optical Drive	48x CD-ROM	Philips DVD+RW	52x CD-ROM	16x Pioneer DVD-ROM, 40x/12x/48x BenQ CD-RW	40x/12x/48x Lite-On CD-RW	40x/12x/48x AOpen CD-RW	16x/40x/ 8x/8x DVD-ROM/CD-RW combo drive	16x/10x/40x Lite-On CD-RW	48x/40x/12x Mitsubishi CDRW	48x/40x/12x Mitsubishi Diamond Data CD-RW, 16x Pioneer DVD-ROM	52x Sony CD-ROM	Sony DVD-ROM, 40x/12x/48x Sony CD-RW	Sony DVD-ROM, 40x/12x/48x Sony CD-RW
Display Adaptor	Onboard	generic GeForce4 Ti4600 128MB	Leadtek GeForce2 MyVIVO 64 MX400	Leadtek Winfast A250 Ultra TD MyVIVO GF4 Ti4600 128MB	GeForce4 MX420 64MB	Gigabyte GV-R9700 128MB ATI Radeon 9700	generic NVIDIA GeForce4 MX420	ATI Radeon 7500 64MB	ASUS GeForce4 V8170 PRO DDR MX460 64MB	ASUS GeForce4 V8170 PRO DDR MX440 64MB	Leadtek Winfast GeForce4 MX440 64MB	Leadtek Winfast GeForce4 Ti4200 64MB	Leadtek Winfast GeForce4 Ti4600 128MB
Monitor	Dell 1503FP 15in TFT	Dell P991 19in CRT	LG StudioWorks 567N 15in CRT	Hitachi CM715 19in CRT	Samtron 76E 17in CRT	Samsung SyncMaster 191S 19in TFT	HP MX76 17in CRT	IBM E74 17in CRT	Polyview 15in TFT	Polyview 15in TFT	Mitsubishi Diamond View 177OH 17in CRT	Sony CPD-E230 17in CRT	Sony CPD-E230 17in CRT
Sound Card	Onboard	Creative Labs Sound Blaster Live! Value	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard	Onboard	Creative Labs Sound Blaster Audigy
Audio Support	Stereo	5.1	5.1	5.1	Stereo	5.1	Stereo	Stereo	5.1	Stereo	Stereo	5.1	5.1
OS	Windows 2000 Pro or XP	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Home
Warranty	2 Years	2 Years	1 Year	2 Years	1 Year Onsite	1 Year Onsite	1 Year	1 Year	3 Years Onsite	3 Years Onsite	1 Year	1 Year	1 Year
Performance	1	1	2.5	3	2	4	2	2	3	3	3	4	4.5
Bang For Buck	2	3	3.5	2.5	2.5	3.5	3.5	2.5	3	3.5	4	3	4
Features	3	2	3	3	2.5	3.5	3	3	3	3	3	4	4.5
Overall	2	2	3	3	2.5	3.5	3	2.5	3	3	3.5	3.5	4

	Marvel Computers Legend DVD	Marvel Computers Sound P DVD	Optima Computers Sound Pentium 4 2.4GHz	Pioneer Computers Value PC	Pioneer Computers DVD PC	Pioneer Computers Power	Pila Corporation Aspect T1	Pila Corporation Aspect T2	Pila Corporation Aspect T3	Pila Corporation Aspect T4	Pila Corporation Aspect T5	Sourcetechnology Sound Economy PC	Sourcetechnology Sound Premium Value PC	Tang Computers Tang Gamer Gamer	TPG XP Pro
	$4,995	$7,595	$1,997	$1,499	$2,499	$3,399	$1,495	$2,495	$3,195	$4,995	$7,395	$1,480	$2,330	$3,085	$2,599
	02 9680 9688	02 9680 9688	02 9475 2777	02 9690 2888	02 9690 2888	02 9690 2888	1800 007 587	1800 007 587	1800 007 587	1800 007 587	1800 007 587	02 9467 1966	03 9467 1966	08 9444 6088	02 9850 0800
	www.marvelcomputers.com.au	www.marvelcomputers.com.au	www.optima.com.au	www.pioneercomputers.com.au	www.pioneercomputers.com.au	www.pioneercomputers.com.au	www.pilacorp.biz	www.pilacorp.biz	www.pilacorp.biz	www.pilacorp.biz	www.pilacorp.biz	www.sourcetechnology.com.au	www.sourcetechnology.com.au	www.tang.com.au	www.tpg.com.au
	Pentium 4 2.53GHz	Athlon XP 2400+	Pentium 4 2.4GHz	Celeron 1.9GHz	Pentium 4 2.4GHz	Pentium 4 2.8GHz	Athlon XP 1900+	Athlon XP 2000+	Pentium 4 2.4 GHz	2 x Athlon MP 2100+	Pentium 4 2.8GHz	Celeron 1.8GHz	Pentium 4 2.4GHz	Pentium 4 2.4GHz	Pentium 4 2.4GHz
	512MB DDR	512MB DDR	256MB DDR	256MB DDR	256MB DDR	256MB DDR	256MB DDR	512MB DDR	512MB DDR	1GB DDR	512MB RDRAM	256MB DDR	512MB DDR	512MB DDR	256MB DDR
	Epox 4BEAR	Epox 8K5A3+	Asus P4B533VM	Gigabyte GA-8IRM	Intel D845EBG2	Gigabyte GA-8IEXP	MSI MS-K7N420	ASUS A7V333	Gigabyte GA-8IEXP	Tyan S2466N-4N	Gigabyte GA-8IHXP	Intel 845EPT2L	Intel D845 EBG2L	Soltek SL-85DRV4	Microstar MS-6526
	2 x 80GB Western Digital Caviar (spanned)	4 x 80GB Western Digital Caviar (RAID)	40GB Seagate U series	20GB IBM Deskstar	60GB IBM Deskstar	2 X 40GB IBM Deskstar	40GB Seagate Barracuda IV	80GB Seagate Barracuda IV	2 x 80GB Maxtor Viper	2 x 80GB Maxtor Viper	2 x 120GB Western Digital Caviar	40GB IBM Deskstar 60GXP	80GB IBM Deskstar 60GXP	80GB Western Digital Caviar	40GB Seagate Barracuda IV
	Pioneer DVD-R	Pioneer DVD-ROM, 40x/12x/48x Sony CD-RW, Pioneer DVD-R	48x/12x/40x Mitsubishi Diamond Data CD-RW	52x CD-ROM	16x LG DVD-ROM	16x DVD-ROM	16x LTD DVD-ROM	16x DVD-ROM, 48x/12x/48x Lite-On CD-RW	16x Sony DVD-ROM, 40x/12x/48x Sony CD-RW	16x Sony DVD-ROM, 40x/12x/48x Sony CD-RW	16x Pioneer DVD-ROM, Pioneer DVR-104 DVD-RW	52x Sony CD-ROM	16x Sony DVD-ROM, 40x/12x/48x Sony CD-RW	48x/12x/48x Sony CD-RW, Pioneer 16x DVD	Mitsubishi Diamond Data CD-RW 40x/12x/32x
	Leadtek Winfast GeForce4 Ti4600 128MB	Leadtek Winfast GeForce4 Ti4600 128MB	Onboard	Creative Labs 3D Blaster 4 Titanium 4200 GF4/64	Leadtek GeForce4 Ti4600 128	Creative Labs 3D Blaster 5 RX9700 Pro Radeon 9700/128	Onboard	Triplex Millennium Silver GeForce 4 Ti 4200 128Mb	Leadtek GeForce4 A250 LE Ti4200 128Mb AGP TV Out, DVI & VIVO	Leadtek GeForce4 A250 LE TD TI 4200 128Mb	Leadtek GeForce 4 A250 ULTRA TD TI 4600 128Mb My Vivo	Pine GeForce2 MX400 128MB	Pine GeForce4 MX420 64MB	Gainward GeForce4 Ti4600 128MB	Onboard
	Sony CPD-G420 17in CRT	Sony SB1 18in TFT	Optima CM712T 17in CRT	Mitsubishi Diamond View 1554 15in CRT	Hitachi CM615 17in CRT	Hitachi CM615 17in CRT	Samsung SyncMaster 753S 17in CRT	Samsung SyncMaster 913TP 19in CRT	Samsung SyncMaster 915DF 19in CRT	Samsung SyncMaster 171S 17in TFT	Samsung SyncMaster 181T 18in TFT	Mitsubishi Diamond View 1554R 15in CRT	Mitsubishi Diamond View 1771M 17in CRT	Samsung SyncMaster 753DF 17in CRT	TPG-branded Mitsubishi 770M 17in CRT
	Creative Labs Sound Blaster Audigy	Creative Labs Sound Blaster Audigy	Onboard	Onboard	Creative Labs Sound Blaster Live! DE 5.1	Creative Labs Sound Blaster Live! DE 5.1	Onboard	Onboard	Onboard	Creative Labs Sound Blaster Live! Player DE 5.1 SE	Onboard	Onboard	Onboard	Onboard	Onboard
	5.1	5.1	5.1	Stereo	5.1	5.1	Optional 5.1	5.1	5.1	5.1	5.1	Stereo	Stereo	5.1	5.1
	Windows XP Home	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional
	1 Year	1 Year	1 Year	2 Years Parts, 5 Years Labour	2 Years Parts, 3 Years Labour	2 Years Parts, 3 Years Labour	1 Year Onsite	3 Years Onsite	3 Years Onsite	3 Years Onsite	3 Years Onsite	3 Years	3 Years	1 Year Parts, 3 Years Labour	1 Year
	3.5	5	2	3	3	4	2	4	3.5	3	5	2	3	3.5	2
	3.5	3	2	3.5	3	3	3	3	4	2.5	4	3	4	3	2.5
	3	4	2	2.5	2.5	3	3	4	3.5	3.5	5	2	3	3	1
	3.5	4	2	3	3	3.5	2.5	3.5	3.5	3	4.5	2.5	3.5	3	1.5



THE HOST with the MOST

A company Web site is a simple, effective way to get the latest information to current and potential customers. But who should host it, how much will it cost and what exactly do you get for your money? *APC* tested seven hosting services to let you know which provider gives the most bang for the buck.

You're part of a small-to-medium enterprise (SME). Your business isn't ecommerce, and you really don't care if you become the amazon.com of your industry, with a super-site that places your entire operation online. You do, however, need a reliable Web site to publish company information, maintain contact with customers, and keep up with the Jones Inc.

The question is, where to host it? Word of mouth and advertising both tend to fail in answering this. Friends and colleagues probably haven't tried that many hosting providers, so it's easy to be recommended a mediocre package. Advertising doesn't help much either, because it often doesn't provide more than a haze of technical specifications.

For the majority of businesses needing a solid but modest Web presence, any number of Web hosting companies will do. The basics of Web hosting are the same anywhere.

What really matters is the subjective experience of signing up, setting up and dealing with customer service. After all, one day your requirements may not be so modest, and it's good to know that the company handling your account is trustworthy and responsive.

APC's mission was to acquire and test a selection of accounts aimed at SMEs — and some of the keener power users — costing less than $100 per month. We tested seven of Australia's top-rated Web hosting providers. These were real tests. We signed on and paid up just like regular customers — the hosts had no idea that we represented *APC* magazine.

In this $100 price range, what's on offer is shared space on a server. The majority of Web sites on the Internet are hosted on such "virtual servers", where many different sites sit on the same box and share resources.

Various service levels provide for a given amount of disk space and monthly data transfer. If your Web site outgrows these limits, you just upgrade to a higher storage and traffic allocation. In cases where your site outgrows the shared server model, hosting companies usually recommend buying your own server machine and co-locating it at their facility.

THE CONTENDERS

We signed up with Telstra, WebCentral, OzHosting, Host1, Info-Tech, WPS and OzNet One. It took about a week to get all the accounts up and



Words: David Emberton

running, and tests ranged from the initial sign up experience through to encounters with customer service representatives.

A number of highly recommended services didn't make the cut, either because they don't offer short-term payment options (such as Ilysys and Secure E Host), or they didn't offer online sign up (among them are Worldcom/UUNet, Singtel and DataOne Asia).

WHAT WE TESTED

In general, all hosting experiences have a similar thread running through them. There's a sign up process that can be completed online. It's here that aspects such as customer details, domain name and billing options are specified. In some cases, setup is instant, but more commonly a set up period of around 24 hours is required before the account becomes accessible.

Once an account is setup, configuration changes can be made via the online "control panel". At a minimum, the control panel allows for setting up email boxes and changing service level. Some of the better ones however, offer Web-based file management, Web mail, traffic statistics and detailed account control. Lastly, there's the all-important support component. All hosting packages come with email-based support, and most provide telephone support as well.

To test the email response capabilities of each company, a very simple message entitled "Perl question" was sent to all of them at the same time. A basic question was chosen, one that could be answered immediately without being specific to either Windows or Linux. The message read as follows: "I was wondering if you could tell me which version of Perl is available on my Web hosting account, and also if there is a special directory I need to place the scripts in for them to work."

For the services that offered phone support, calls were made at various times to measure wait times and the overall quality of service on offer. Of course, one of the biggest considerations with any hosting solution is speed and capacity. We ran ping time and download tests for each account, and the results were roughly equal, with Telstra, OzHosting and WebCentral edging out the competition.





Telstra Hosting

www.telstra.com/hosting

Economy Site
$54.95/month + $89 set-up

What you get

Disk space 80MB
Transfer per month 700MB (200 upload/500 download)
Platform choice(s) Microsoft IIS
Email boxes 5
Database support N/A
Server-side languages ASP, Perl
Mailing lists N/A

SIGN-UP ●●●●○

URL http://telstra.com/hosting/common/sign up/
Billing options Set-up by credit card, invoices thereafter
Time to activation 38 hours

The sign-up wizard was an 11-step process. This approach had its disadvantages: at one point we hit the back button in the browser and all the session information was voided. Curiously, Telstra will only charge set-up and domain registration fees to a credit card; monthly charges must be paid by invoice. However, the whole amount can be paid by invoice. Post sign-up and payment were made via credit card, and the account was ready within 38 hours.

CONTROL PANEL ●●○○○

The Site Management Interface only allows for changes to account details and passwords, plus the downloading of log files. In fairness, at the service level tested there weren't that many features turned on by default. Considering the price of the package was in the upper range, more bang-for-the-buck was expected here.

SUPPORT ●●●○○

Cost per call Free, 1800 629 123
Phone wait time 30 seconds
Email response time 24 hours plus

We began with the standard Perl email. Over 36 hours later, Telstra was unable to match the enquiry to an account and emailed back asking for clarification. A reply was sent along with another question. At this point "due to all the issues," we were asked to call the service centre instead.

After the disappointing email support, the phone experience was pretty good. Wait times were practically non-existent, except for a recorded message about calls being "monitored or recorded". The representatives spoken to were friendly, though not always helpful.

One of the real issues with the Telstra account was the lack of a temporary way to access content via a Web browser while a domain was being applied for or redelegated. All the other services offered this (some with coaxing required), but the Telstra representative we encountered steadfastly asserted that such a thing couldn't be done.

Overall score ●●●○○

WebCentral

www.webcentral.com.au

Business 2002 Package
$60/month + $97 set-up

What you get

Disk space 70MB
Transfer per month 750MB
Platform choice(s) Microsoft IIS
Email boxes 20
Database support Access via ASP
Server-side languages ASP, Perl
Mailing lists One, with up to 1,000 subscribers

SIGN-UP ●●●●●

URL www.webcentral.com.au/docs/pages/join_webcentral.cgi
Billing options Credit card or invoices
Time to activation Instant

The sign-up page was very easy to find, and consumed a single compact page of options. The sign-up process included a few added touches. Up to five email boxes could be created upfront, saving configuration time later on. And there were a range of payment options offered: auto-debit payment from a credit card, debit a card for the initial invoice only, or no card with monthly invoices. Account creation is entirely automated and instant. After completing the sign-up form, a username and password pair was immediately emailed, along with instructions for accessing and configuring the account. Impressive.

CONTROL PANEL ●●●●◐

Highlights include the ability to quickly submit site information to major English, Japanese and Chinese search engines, add dialup Internet access for various users, view full server statistics, set up a secure ecommerce form, even sign up for HTTPAfterBurner and automatically mirror the site in other countries for faster international access.

Missing was integrated Web mail and file management, but it far surpassed any other offering's usability and breadth of features. However, "extra" features were shown without much explanation of the extra costs.

SUPPORT ●●●●○

Cost per call Free, 1800 800 099
Phone wait time 60 seconds
Email response time Online, 24 minutes

Sending an email to support@webcentral.com returned a message asking to visit Mission Control. WebCentral's job system had the advantage of three levels of priority. Being able to specify when a problem was "critical" as opposed to "normal" was useful.

The Perl question was submitted as a job and answered in 24 minutes, with an offer to re-open the job if more information was needed.

Phone delays were the longest of all the companies reviewed. We called at a few different times and the wait was around one minute each time. Staff were friendly, even when faced with painfully obvious questions.

Overall score ●●●●◐

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- php/perl

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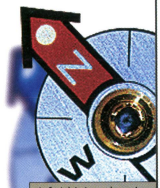
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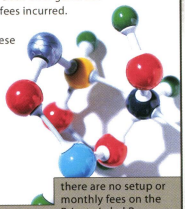
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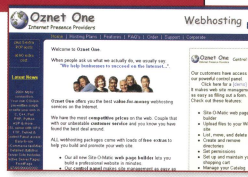
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OzNet One

www.oznet1.com.au

Business Power Plan
$25.20/month + $33 set-up

SIGN-UP ●●●○○
URL www.oznet1.com.au/order.htm
Billing options Credit card initially, invoices thereafter
Time to activation Eight hours

OzNet One's sign-up process was fairly straightforward. Similar to Info-Tech, OzNet outsources its payments to a third party provider, which unfortunately means entering details twice.

Impressively though, a detailed and well-written email confirming the order was sent even before we'd finished filling out the payment form.

After the payment was finalised, an account was set up in eight hours.

CONTROL PANEL ●●○○○

OzNet One's control panel was practically identical to Info-Tech's, which was a little surprising at first. But it turns out OzNet One and Info-Tech are both resellers of services provided by the same third company, which provides a standard but customisable Control Panel. So of course nothing was new here.

Account setup was still missing, but the nifty extras like the Site-O-Matic, CGI script explorer and search site tools were again present.

SUPPORT ●●●○○
Cost per call N/A
Phone wait time N/A
Email response time 26 minutes

Despite a lack of phone support — or even a phone number — OzNet One did have almost the fastest email response of all the companies tested.

The responses were detailed and clear, and a copy of the original question was included for future reference.

Having said that, fast and well written as email responses might be considered a good way to deal with companies in general, it's hard to make up for the lack of personal phone support.

What you get

Disk space 150MB
Transfer per month Unlimited (conditions apply)
Platform choice(s) Linux
Email boxes 20
Database support MySQL
Server-side languages Perl, ASP, C, C++, Python, Java
Mailing lists Majordomo

Overall score ●●◐○○

OzHosting

www.ozhosting.com.au

Standard Package with 75MB
$54.90/month + $53.90 set-up

SIGN UP ●●○○○
URL www.ozhosting.com/Services/WebHosting/join.asp
Billing options Credit card or invoices
Time to activation 36 hours

Instead of a selection of predefined packages, customers build their own by choosing a platform, space allocation and additional extras. At the time of the trial, Windows 2000 and Linux were both available, with Microsoft's .NET listed as "coming soon". The rest of the process was straightforward, however, we entered credit card details hoping to pay monthly, and ended up being billed for a full year. Several days after the account was activated, it was converted to the monthly plan and the excess charges refunded.

CONTROL PANEL ●●●◐○

All the standard bases were covered. Welcome extras like billing information were also present. Curiously, a data source option showed up which led to a page explaining that data sources weren't available at our service level, and that DSNless connections were faster anyhow.

Clicking onto the page of information about these DSNless connections brought up a page of information that was Windows specific. We had chosen the Linux hosting package. Particularly likeable were the large question marks and "please explain" links next to technical jargon terms — great for non-experts.

SUPPORT ●●●○○
Cost per call Local, 1300 553 737
Phone wait time 20 seconds
Email response time Email was lost, online ticket 21 minutes

The initial Perl question email, and another set-up query, triggered automated replies suggesting that they had been added to the electronic support system. A response regarding Perl came back via email within the hour. But, three days later the second question was lost altogether and neither ticket was showing up in the control panel.

Phone support was good, with wait times of 10 to 30 seconds, except in one case. Overall, dealing with OzHosting support was pleasant and response times within the ticket system were lightning fast.

What you get

Disk space 75MB
Transfer per month 1GB
Platform choice(s) Windows 2000, Linux
Email boxes 5
Database support Access
Server-side languages PHP, Perl, ASP
Mailing lists One, with up to 50 subscribers

Overall score ●●●○○



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www.host1.com.au

Business Package — three month pre-pay
$104.85 ($34.95/month) + $55 set-up

What you get
- **Disk space** 40MB
- **Transfer per month** 1GB
- **Platform choice(s)** Windows, Linux
- **Email boxes** 10
- **Database support** MySQL (Linux), Access (Windows)
- **Server-side languages** ASP, Perl, PHP (Linux)
- **Mailing lists** N/A

SIGN-UP ●●●○○
URL www.host1.com.au/register/
Billing options Credit card or invoices
Time to activation 36 hours

Host1 presented its sign-up options as a multi-page wizard. It didn't really offer any clue as to how many steps were involved or how far along we were at any given point, except to provide a previous and next button. However, the sign-up was extremely easy to find with a prominent link from Host1's home page.

Although Host1 did require either quarterly or yearly pre-payment, it was up-front about this fact.

CONTROL PANEL ●●○○○
Host1's Control Panel was a classic case of form over function. The menu header featured stretched-out text that was difficult to scan comfortably, although an introductory page explaining each option did make things a bit easier to grasp.

Although email, set-up and access stats were included, at the time of writing roughly one-third of the displayed options in Host1's control panel were disabled and showed "under construction" or "under development" pages. This included all the FTP set-up options and the account details page.

Host1's panel was also lacking a homepage link of its own, so there was no way — except for clicking the Back button several times — to return to the initial descriptions page.

SUPPORT ●●●●○
Cost per call Local, 1300 555 900
Phone wait time None
Email response time 37 minutes

Host1 offers telephone support from 8am to 7pm AEST Monday to Friday and 10am to 5pm on Saturday. Email support is available at any time. An answer to the Perl question email arrived within 37 minutes.

A second more complex set-up question took six hours for a reply, although this was sent on a Sunday. Altogether, a good experience but nothing spectacular.

Overall score ●●●○○

WPS
www.wps.com.au

Small Business Plus — 2 month pre-pay
$59.90 ($29.95/month) no set-up

What you get
- **Disk space** 200MB
- **Transfer per month** 1GB
- **Platform choice(s)** Microsoft IIS
- **Email boxes** 15
- **Database support** N/A
- **Server-side languages** Perl
- **Mailing lists** List manager provided

SIGN-UP ●●●●○
URL www.wps.com.au/webhostingform.html
Billing options Credit card only
Time to activation 16 hours

WPS is unique among the other companies in our tests because there was no set-up fee involved, just a minimum two-month commitment.

Its sign-up area wasn't linked from the WPS home page. After confirming payment, clear instructions explained that the account would be activated within 24 hours. The company's DNS server information was displayed at this point also, meaning that domain changes could be started immediately — without waiting another day.

Telstra was the only other company to have provided this information during sign-up.

CONTROL PANEL ●○○○○
Rather than being a separate Web application, the MyWebCom control panel was a list of nine radio buttons representing various actions (such as "New Email alias") and a Go button. Navigation was minimal; it was necessary to use the Back button and re-enter a password after each action was completed.

Apart from changing the service level, there were no ways to change account details or alter billing information. Statistics and other standard offerings were also missing, and some of the options that did exist simply led to a message suggesting that we "email support."

SUPPORT ●○○○○
Cost per call Long distance, (07) 3207 9313
Phone wait time None
Email response time 64 minutes

Because of WPS' strictly hands-off approach, none of the emails sent directly to support@wps.com.au were replied to. However, it was possible to get a response from the real hosting provider, Activstate.com.au.

Phone support was fast and helpful. Email support was a little slower than the competitors, taking roughly an hour to respond.

Although the folks at Activstate can't really be faulted for service, WPS disappointed with their sign-up and run attitude.

Overall score ●●○○○

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Read the fine print and avoid Web hosting hassles

HIDDEN COSTS

Despite offering a monthly payment option, according to the Terms and Conditions, a two-month up-front payment is required for OzHosting plus an additional 7.5% each month on top of the advertised price. WebCentral also charges an additional $3.50 per month for monthly invoices rather than paying by auto-debit.

TRANSFER RATES

Most mid-range hosting accounts include 500MB to 1GB of data transfer each month. WebCentral and OzHosting impose a flat 13.2 cent levy on additional megabytes, whereas Telstra differentiates between uploads (20.9 cents per megabyte) and downloads (8.8 cents per megabyte). If your Web site is suddenly deluged with traffic, these charges can quickly add up. It's a good idea to make sure the host provides decent statistics so you can monitor usage over time and upgrade when necessary.

ACCOUNT CANCELLATION CONDITIONS

It's time to switch providers or close down your Web site, but can it be done instantly? In most cases the answer is yes, but sometimes an obscure 30-day written notice clause, buried in the Terms and Conditions, can come back to haunt you.

WebCentral and Host1 both required 30 days written notice, citing security concerns. The remaining providers all fulfilled account closure requests immediately, give or take a day.

SPECIAL PROMISES

Info-Tech and OzNet One both offered "unlimited" data transfer, but in the fine print it turned out this was entirely dependent on the kind of content being published. You'd think data is data, but apparently not, since sites containing the following are excepted:

- *Containing archives or galleries or offering files for download where the file types involved make up more than 20% of the site's total traffic*
- *Which contain images, CGI programs or similar content which are accessed from other sites*
- *Where more than one domain name points to your home page*
- *Using more than 5% of system resources*
- *Generating an unusually high amount of traffic from images or other binary files*

Then there was Host1's promise of 99.9% uptime with a money-back guarantee; this is limited to their Linux installations.

REMOVAL AND TERMINATION

In OzNet One and Info-Tech's case, they're mostly concerned about shutting off accounts that prove too popular and start making good on the promise of unlimited traffic. Telstra reserves the right to cancel service if you discuss anyone's business except your own, breach a copyright or even publish something that "a reasonable person may find offensive". Always check the circumstances under which the host can terminate your service or remove content.

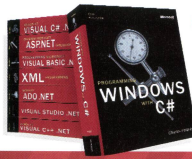
Web hosts versus ISPs

Technically, Web hosting is an "Internet service", so the line between an ISP and a Web host is a blurry one. It's a matter of focus: do you want a company that specifically deals with hosting sites, or one that shares its energies between hosting and providing dialup access?

Often ISPs will offer hosting to round out their roster of services and earn additional revenue, even though it isn't their main area of expertise. With smaller ISP/hosts, connectivity is shared between the incoming download traffic and the outgoing hosting traffic, which (depending on the size of the link) can result in slowdowns during peak times.

Security can also be an issue. In the past, small businesses have been hit with huge bills after a denial of service attack on their site. The ISP hosting the site has charged for upstream traffic. This is frustrating when it is a simple matter to cut off the flooding. Another security concern arises in the event of a targeted hacking attempt. When you pay for an entry-level Web hosting service, your Web site is likely to reside on the same server as other businesses. If one of those sites somehow becomes the target of a successful hacking attempt, your site will also be compromised. It's worth asking how quickly your site can be taken offline during an emergency or what contingency measures are in place to limit financial damage to your business.

If you're serious about having a Web presence, at the very least make sure that the ISP and hosting operations of your chosen company are maintained separately, with unique customer service numbers. When things go wrong, you'll be glad you chose the professionals.



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Info-Tech
www.info-tech.com.au

Super Plan
$32.95/month + $32.95 set-up

What you get
Disk space 500MB
Transfer per month Unlimited (conditions apply)
Platform choice(s) Linux
Email boxes 20
Database support MySQL
Server-side languages Perl, C, C++, Python, Java
Mailing lists Majordomo

SIGN-UP ●●●○○
URL www.info-tech.com.au/apply.htm
Billing options Credit card only
Time to activation Six hours

After choosing from pre-configured plans, we filled out just one information form. We were then presented with a list of minimum up-front payment amounts and the choice to proceed to a credit card billing page. We were supposed to remember the chosen plan minimum amount (from the previous page), and enter it by hand because the payment was being handled by a third party. This wasn't a big ask, but poor automation isn't confidence inspiring.

Payment was fast and smooth, but there was no indication of what would happen next or how long the account would take to create. In the end though, it took only six hours.

CONTROL PANEL ●●○○○
On the one hand, even the most basic account set-up options like customer details were missing altogether. But on the other, nifty features like a Site-O-Matic page builder, Web-based file management and the ability to check a site's ranking in the top 10 search engines were included. Overall, the lack of account management and facilities were disappointing.

SUPPORT ●●●○○
Cost per call N/A
Phone wait time N/A
Email response time 28 minutes

Info-Tech didn't offer phone support in any way, shape or form. Searching the White Pages yielded no additional clues as to their phone numbers, so email really was the only available communications channel.

With email support, Info-Tech was fourth fastest, with a reply to the "Perl question" arriving in just 28 minutes. It was one of the better responses in fact, with the most amount of detail and a reproduction of the original message.

Even with the high quality email response, the lack of phone support made Info-Tech's experience suffer.

Overall score ●●◐○○

How Web hosts rate

Although the general ingredients are the same across all companies, the actual implementation and mix of features ranged rather wildly. It's extremely difficult to tell from outward appearances exactly what you're getting, and who's providing it. At least three of the companies in our tests (WPS, Info-Tech and OzNet One) turned out to be resellers of services. Info-Tech and OzNet One were even resellers for the same company.

Technically there's nothing wrong with reselling, but it is frustrating to pay money to a "hosting company" only to discover that very little of the service is actually provided by that company.

So, paying a little extra to go with a reputable top-shelf provider is best? Although WebCentral was almost flawless in every test, Telstra — the most expensive package — was hardly a star performer.

After tallying the scores across sign-up, control panel and support, WebCentral emerged as the clear favourite. Telstra came a distant second, but only because of OzHosting's unfortunate sign-up process. Predictably, the cheaper offerings tended to fare worse in the control panel and support areas, but they often had strong sign-up experiences.

webCentral.com	13.5/15
Telstra Telstra Hosting	9/15
ozhosting.com	8.5/15
HOSTONE	8.5/15
Oznet One Internet Presence Providers	8/15
Infotech Hosting superior web hosting	8/15
WPS	6/15

The winner: Webcentral

Good Its instant-on approach to account set-up and no up-front billing was a real joy, and Mission Control was by far the most attractive and functional control panel. Also, WebCentral included 20 POP email accounts as part of the package.

Bad The service is Windows-only and fairly heavily Microsoft biased (FrontPage support is built right in) so if you want Linux or UNIX you'll have to try another provider. WebCentral also offers fewer free hosting features in the tested price range than many of its smaller competitors.

The lemon: WPS

Good Cheap, no set-up fees and plenty of features.

Bad Weren't the direct provider of services, scant control panel, patchy responses to support emails.

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WORKSHOP

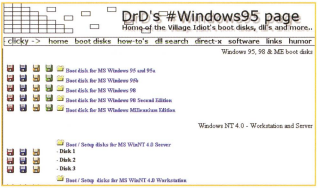
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APC readers fall into two categories: either they already have a home network, or they're going to set one up. So this month we introduce a new series of Workshop articles on networking, and kick-off by tackling the cumbersome issue of getting Windows 9x and XP machines talking to one another.

And if you're among the many readers asking for articles on the Pocket PC, we've been listening! *APC* will now alternate between Palm and Pocket PC workshop articles every month. Check out our debut article on skinning your Pocket PC — it's a must for handheld fans and a superb way to make your PPC stand out from the look-alikes crowd.

Plus, there is a companion feature to Mandrake 9 on our triple CD cover set, practical programming with Perl, a fab and free Flash replacement, CSS coding and plenty more. So roll up your sleeves, turn the pages and get into it!

Workshop's site of the month



You know what it's like . . . there's never a boot disk around when you need one. Well, maybe it's just that you haven't looked online. Dr Device **(www.drd.dyndns.org)** is big on boot disks, with downloadable boot disk images for all flavours of Windows, including a single disk for Windows XP setup. There's also a selection of utility-packed boot disks. All disks are downloadable as WinImages (which copies directly onto a blank floppy) or self-extracting DOS disks.

Bonus CD software

Most Workshop articles are accompanied by bonus software loaded onto our triple CD set — just look for this icon.

This is often software that is integral to the article, such as this month's features on using SWiSH to create text Flash animations or installing Linux Mandrake 9. The selection ranges from full-working versions and trial versions to shareware and freeware.

***APC* cannot provide tech support for these programs, but if you've got a problem with the CD itself, by all means holler our way (see pages 10-11 for details of how to contact our CD team).**

In **Workshop** this month

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How does your computer rate against others? We show you how to benchmark your PC.

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Installing Linux has never been easier than it is with Mandrake 9.

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Brand your PDA with your own style using PPC2002's in-built skinning features and third party apps.

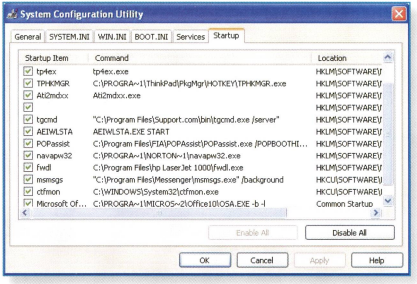
Benchmark your PC

How does your computer rate against this month's megatest contenders? *Ashley McKinnon* explains how to benchmark your own PC.

So you think your computer is fast? Here's how you can put it to the test find out how much grunt it *really* has!

But there's more behind benchmarking than idle curiosity or even curing CPU envy. Once you've tested your current system, the results can serve as a baseline against which you can measure performance when you fit a new hard drive or video card, add some memory or even after a bit of overclocking. Comparing the pre- and post-upgrade results is the best way to determine how much you have gained.

Benchmarking can also be used to check if your system isn't running as well as it should. By testing individual components you can see if they're performing as well as they did during the initial baseline tests.



Stopping startups: *MSCONFIG reveals the hidden apps inside the Registry that load with Windows.*

START WITH A CLEAN SLATE

The first step in benchmarking is to pare your system back to the basics. The ideal is to have no programs running in the background which could interfere with the test programs, soak up memory or degrade performance.

The best tool for this is the hidden, but very handy, MSCONFIG utility, which oddly enough comes with Windows 9x, Me and XP (but not 2000). Use the Run prompt to launch MSCONFIG (and consider putting a shortcut to it on your Start menu, as MSCONFIG is great for troubleshooting).

MSCONFIG's Startup tab lists the programs and tasks that are loaded with Windows. Not all of these appear in the Startup folder: in fact, the majority are tucked away inside Registry keys. No matter, as MSCONFIG reveals them all and lets you disable them from the OS's start sequence.

How far to go is another matter. You should certainly remove obvious candidates such as programs listed in your Startup group, along with utilities and quick-launchers which lodge themselves in the system tray. In short, spike anything that's not really needed by your system.

Beyond this, there are two schools of thought. Some users prefer to disable almost everything but Windows itself so they can measure the PC's maximum potential performance. Others keep most of the system tasks loaded via the Registry so the results are more realistic.

The choice is yours; you might even want to run the tests under both conditions to see if there's any difference.

Notebook users need to be a little more selective than desktop users, as some startup tasks are required by the hardware for correct performance.

You should dive into the Display Settings applet to disable the screensaver and set all Power Saving options to Never. Also, remove any desktop background and set the default resolution to 1,024 x 768 at 16-bit colour.

Right-click on the Taskbar, select Properties and disable the Keep the Taskbar on top of other windows or Always on Top option, depending on your version of Windows.

Users of Windows Me and Windows XP will also need to disable System Restore from the Control Panel's System applet. In XP, select the System Restore tab; in Windows Me, select System Properties, File System then Troubleshooting.

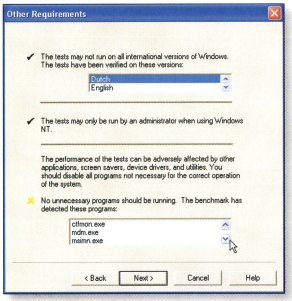
Also be sure to install the latest version of DirectX (included on this month's cover CD) and update all your system drivers to the latest version.

The final task is to defragment the hard drive. This will ensure that all files and data on the drive are in their most efficient state. This step could take some time but it's absolutely necessary for a correct benchmark result.

When all that's done, reboot your PC and you're ready to put it to the test.

BENCHMARKING SOFTWARE

There are dozens of benchmarking programs, but most experts agree on a handful as providing the most accurate



and most relevant results. Some of these assess only a specific part of the PC, such as the hard disk or video subsystem; others run a battery of tests which can combine into an overall rating.

We've included the best of them on this month's cover CD set: SiSoft Sandra 2002, WinBench, Business Winstone, 3DMark, BatteryMark and the Quake III Arena demo. Sysmark is another superb benchmarking tool but is only available for purchase through MadOnion (**www.madonion.com**).

Sandra 2002 Although commonly used and heavily quoted by many online hardware review sites, Sandra 2002 (from **www.sisoftware.co.uk**) relies on artificial measurements of your system's hardware components. This makes it less valuable than other benchmark suites such as WinBench, although you'll certainly find out more about your hardware than you'll ever need to know!

WinBench 99 Version 2.0 It's been a long time without an update, but WinBench 99 (from **www.etestinglabs.com**) remains an evergreen among serious hardware hounds for its thorough testing of all system components.

When installing WinBench 99, be sure to select the option to install Graphics WinMark support files. When you run WinBench 99 it checks if your system is ready to be benched: you may have to use the Windows Task Manager to shut down any other programs WinBench 99 detects in the background.

Set up WinBench 99 by choosing Edit, Test Settings. On the User DirectDraw tab, match the resolution to that of your system. Next, click the Repetition tab and set both Reboot and Defragment options to Before each run of the selected test.

You can choose individual tests or the lengthy All Tests sweep, which takes from 90 minutes to three hours depending on your PC. The test results can be compared against a set of predetermined results from the main screen.

Business Winstone 2001 Whereas WinBench tests your PC's physical components, Business Winstone 2001 (also from

Background programs: *if any programs are running in the background, Business Winstone 2001 lets you know before continuing.*

Interpreting the results

As everybody's system is different, it would be rare to see your results match that of someone else's. As such, here's a brief rundown of what to look for in returned results, and what it means for you.

Sandra 2002 As Sandra 2002 runs a different benchmark for each component, many different scores are returned. Within the results window however, you can select scores from several other systems to compare to yours.

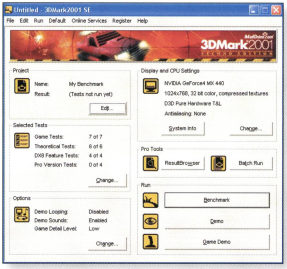
WinBench 99 Version 2.0 As it runs several tests, many scores are returned at benchmark completion. The key to remember here is that larger scores are better — except for CPU Utilisation and Audio/Video quality scores, as these measure degredation. For a more detailed explanation of results interpretation visit **www.etestinglabs.com/benchmarks/winbench/wbhome.asp**.

Business Winstone 2001 Also comprised of many tests, Business Winstone 2001 returns only a single score. This score is determined by how long the target machine takes to run through the series of applications. Business Winstone 2001 uses a baseline score of 10.0, derived from a test machine (500MHz Pentium III, 128MB of RAM) and can be used as a simple comparison to your machine.

3DMark 2001 The resulting score that 3DMark 2001 returns is measured in 3DMarks. The higher the score the better, and this is determined by averaging out all the scores returned from the various tests. On the summary screen you can click on the Show Details button to be given more precise information, such as frames per second (fps) and other scores. You can also click on the Online Results button to be taken to the MadOnion Web site, where you can save your results online and compare against other peoples' results.

BatteryMark 4.0.1 Results returned by BatteryMark are the easiest to interpret of all the benchmark utilities as they are in a simple time format. After a Life Test was run on our Toshiba Satellite Pro 4600, BatteryMark returned a result of 1 hour and 48 minutes. This is how long the system should last under normal operating conditions.

Quake III Arena The test that Quake III Arena does is very simple, and measures how many frames per second the system was able to achieve while playing back the demo. Once again, the higher the score the better. Some examples of Quake III Arena fps scores can be seen at **http://appzone.intel.com/performance/Platform.asp?User=2&Category=3**.



Ready to go: *simply clicking on the Benchmark button sets 3DMark2001 in motion.*

www.etestinglabs.com) measures the system's performance at running applications.

The only thing to watch during installation is that the Copy Business support files (350MB) option is selected. Apart from that, you can stick with all the defaults.

From the main screen select Edit, then Test Settings; click the Repetition tab and set the Reboot option to Before the first run of each test, and Defragment option set to Never.

Click the Run button to start benchmarking. As with its sibling, you can compare your results to a set of predetermined results.

3DMark 2001 This suite from **www.madonion.com** tests your video card and graphics subsystem for both graphics and memory performance.

You can tailor the program for different tests, select which tests run and also view information about your Display and CPU settings.

Clicking on the Benchmark button sets the tests in motion.

BatteryMark 4.0.1.0 Also from **www.etestinglabs.com**, BatteryMark lets you determine if your notebook really lives up to the manufacturer's claims for battery life.

BatteryMark begins with a "conditioning run", which rapidly drains the battery from full to zero charge. It's advisable to run this procedure at least twice to make sure the battery has been fully conditioned. During these tests you'll be prompted to attach and remove the power supply several times.

BatteryMark's "life test" sets the system into an automatic mode which starts and stops several different applications so that it mimics everyday use. These keep running over and over until the battery has been completely drained.

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Mix'n'match Windows

***Serdar Yegulalp* shows how to take the pain out of running Windows XP and 9x machines on the same network.**

Draw up a Top Ten list of complaints for Windows and this one will probably be among them. In terms of networking with Windows, it's number one with a bullet. Cries of "I can't see my XP box," or "My Win98 machine isn't showing up on the network," constantly ring out among those running a network with machines on both XP and 9x.

Microsoft has generally not made a big issue out of this problem, probably because they see it as a case of Windows machines not being configured correctly rather than there being inherent defects in the OS itself.

To some extent they're right, but there are aspects of Windows (especially Windows 98) that, when left to their "out of the box" defaults, create serious problems in mixed networks. Here's how to identify and overcome the most common of those networking woes.

FILE AND PRINTER SHARING FOR MICROSOFT NETWORKS NOT PRESENT IN WINDOWS 98

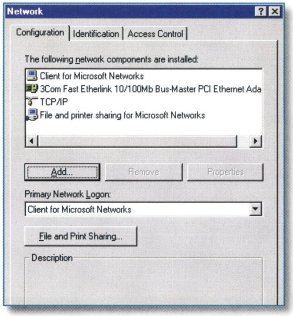
Windows 98's network stack — the collection of device drivers that control Windows 98's networking — includes a component known as File and Printer Sharing for Microsoft Networks. When present, this component allows Windows 98 to share out files and printers, and to see other machines doing the same across the network.

There are a couple of things to remember about File and Printer Sharing in Windows 98.

It's not installed by default If you install Windows 98 on a machine that has no networking capabilities or dialup only, File and Printer sharing is not enabled; it has to be turned on manually. To do this, go to the Network icon in the Control Panel and click on the File and Printer Sharing button in the Configuration tab. Check off "… access to my files" at the very least. (Note that you cannot actually give anyone access to files or folders unless you explicitly share them out.)

Also, there must be a driver labelled File and print sharing for Microsoft Networks present in the list of network protocols above the File and Printer Sharing button. If it isn't there, click Add, select Clients, and File and Printer Sharing. You might need to provide the Windows CD-ROM for this step.

Something needs to be shared for your machine to be visible on the network If you're not sharing anything, you have no reason to be visible. You can still browse other people's computers (provided *they're* sharing something!), but you won't be visible on the network as having a share.



Actively sharing: *if File and Printer Sharing is present and active, it should show up in the list of network protocols for Windows 98.*

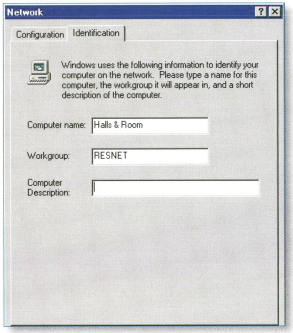
The obvious way to solve this problem: share something out on the target computer and it should show up! (There may be a slight delay from the time you start sharing to the time when the machine appears in other people's Network Neighborhoods).

THE WRONG WORKGROUP NAME

Most of the networks where XP machines and Windows 98/Me machines talk to each other is a *workgroup* environment, or a peer-to-peer setup. Every machine acts as both a client and a server, depending on what they are doing at any given moment. Microsoft's mechanism for grouping machines that may be sharing the same LAN is the workgroup, a way of signifying which machines are peered to which.

In Windows 98, the workgroup setting is under the Network icon in the Control Panel. Click on the Identification tab and you'll see entries for Computer Name, Workgroup and Computer Description. Computer Name and Description can be almost anything you want, but the Name must be unique to that machine. The Workgroup has to be exactly the same for all machines on the network that need to see each other.

By default, Windows sets up a workgroup named WORKGROUP (all workgroup names are upper case). It's a good idea to change this from the default to make sure you've inspected every machine's network settings — just make sure the workgroup name is precisely the name for each machine you want visible to each other. Workgroup names should be



All in a name: *the workgroup name can be anything as long as it's all caps and only letters. All machines in the same workgroup must have the same workgroup name.*

letters only — no numbers, spaces or punctuation.

LOGIN CREDENTIALS

Windows 98 and XP deal with users in fundamentally different ways. When Windows 95 first came out, there was generally only one user for a given copy of Windows — a holdover from the old Windows 3.*x* days where there was *no* user/login system. When you install Windows 98, you're asked to create some kind of user login information when you set up local networking. But not everyone does this: the network login can be bypassed by simply pressing Esc.

Because of this, most Windows 98 machines don't have any kind of network credentials they can pass on to other systems. User credentials are used for verifying if a given user should be granted or denied access to a shared object — a file, a folder, a printer for instance. If there is no user information sent, then the request is automatically denied. Worse, if the username on both machines is the same *but the password information is different*, the login will still be denied.

The only way to get around this is to ensure that every machine that is either accessing or being accessed has the same username and password on it for each user. Go to the User Accounts and Password icon in the Control Panel and add the proper username and password information.

Do this for each machine, client and server. After this log off and log back on again on the machine you're using to access the network with this new username and password. You don't have to be logged in this way at the machine you're trying to access; you just need to have the right user credentials registered in it. But you do need to be logged in as that user on the machine you're accessing *from*.

If you're trying to access shares on a Windows XP machine, adding new users in XP is simple: Control Panel, User Accounts, Create a new account. The new account should be a "Limited" account, not an "Administrator" account, unless you want to grant that user Administrator-level network access to your XP computer.

BROWSE MASTER PROBLEMS

One other lesser-known problems, especially in a heterogenous network, is the Browse Master issue. To explain you must be clear on how Microsoft Networking works.

In order to see the contents of the local network, one of the Microsoft Networking machines on the network maintains what's called the browse list. This is a list of what machines are currently attached to the local network and providing shared resources. When you start up your computer, the machine will scan the network to look for a master browser — a machine that maintains a copy of this list.

If it doesn't find anything, then it conducts an "election" to select a new master browser. The type of machine selected for the master browser is, in descending order of preference:

1. Windows XP Professional
2. Windows XP Home
3. Windows 2000 Server
4. Windows 2000 Professional
5. Windows NT 4.0 Server Enterprise Edition
6. Windows NT 4.0 Server
7. Windows NT 4.0 Workstation
8. Windows 98/SE/Me
9. Windows 95
10. Windows for Workgroups 3.11

If you had two Windows 98 machines on a network and one Windows 2000 machine, the Windows 2000 machine would be elected to become the master browser. An

Sharing their differences

One of the big differences between the way 9x/Me shares out files and folders and the way XP does the same is, in fact, a rather disappointing strike against XP. In Windows 98/Me, you can share out a folder but require a password to access it. In Windows XP Home, you can either share a folder or not share a folder, but you cannot control who accesses it: it's all or nothing. You can set whether or not the folder in question can be changed by other users, but you can't edit the actual permissions on the folder. The only way you can do that is if you upgrade to Windows XP Professional.

Windows XP Professional allows you to share out a folder with detailed permissions, but this functionality isn't enabled by default — you have to turn off the Simple File Sharing system that XP uses and enabled ACLs, or Access Control Lists. To do this in XP Professional, click Start, My Computer, Tools, Folder Options, View, scroll to the bottom of the list of advanced settings and uncheck Use Simple File Sharing. Once you do this you'll be able to click on the Permissions tab of a shared folder and edit a list of users who have access to the folder.

> ***Protocols:*** *NetBEUI is often used with non-Microsoft networking systems such as NetWare. If you're not using anything except Microsoft Networking, you only need TCP/IP.*

election also takes place if the master browser goes offline, is shut down or otherwise unable to continue maintaining the list.

This system doesn't work all that well, and whenever different kinds of Windows machines appear on the same network the elections often misfire and produce confusion. One way to get around this is to simply force all the machines that you know are never going to need to be a master browser (that is, workstations) to never allow themselves to be set up as master browsers. This way, the machines that *should* assume this role (such as the Windows XP machine that you have running all the time) always will.

To stop a given machine from being a master browser, click on the File and Printer Sharing for Microsoft Networks service in the network stack and click Properties. In the Advanced tab that comes up there will be a selection for Browse Master. Set it to Disabled, click OK, and close everything. Reboot to make the changes take effect.

This isn't a perfect solution either. If your XP machine goes down, none of the other machines can be a master browser and the local network will appear to be empty. But if you know that one machine is almost always going to be up and deserves to be the master browser for the network, this is one way of avoiding this problem.

NETWORK PROTOCOL CONFLICTS

Protocols are the underlying language of the network, the standards upon which all machine-to-machine communications rest. Most of us are familiar with TCP/IP, the protocol used by the Internet and by almost all LANs as well. TCP/IP is the one network protocol that is installed in just about every Windows machine by default.

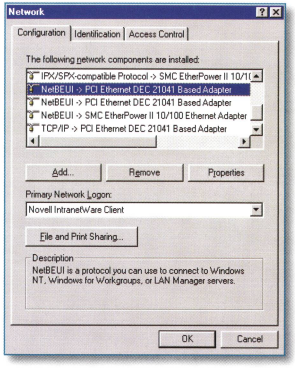
Notice I said "just about." In the early Windows 95 days, TCP/IP wasn't always the protocol of choice. NetBEUI was also used as the main Windows local network protocol. NetBEUI is a *non-routable* protocol, used specifically for local networks instead of wide-area networks like the Internet. Many people have a NetBEUI driver installed on their Windows 9x systems, especially if they've had the system for a while.

The problem with having NetBEUI and TCP/IP in the same system, especially a Windows 9x system, is that the two can interfere with each other. Most of the reasons for keeping NetBEUI at this point have passed into history: many claimed that NetBEUI was faster than TCP/IP for routing local network segments, but the difference in speed between the two at this point is not worth the hassle.

If you have NetBEUI, remove it and stick with TCP/IP for both local and wide-area networks.

OTHER UNDERLYING NETWORK PROBLEMS

Sometimes the reason the two machines cannot see each other is simply because the network is fundamentally misconfigured. This stage of troubleshooting should be done before anything else to make sure all the basics are covered:



Do all of the machines in question have an IP address? If your machines are linked together in a LAN and use ICS (Internet Connection Sharing) to get to the Internet, odds are they should all have an IP address. You can check this by typing WINIPCFG in Windows 9x/Me, and IPCONFIG from a DOS prompt in Windows XP/2000. If there is no IP address (0.0.0.0) or if the IP address is autoconfigured and there is no gateway address, then your machine is not properly connected to the network (Did the cable fall out of its socket?).

Also check to make sure the network hardware itself is not malfunctioning — sometimes a good tug on a network cable can yank a card clean out of its socket.

Can you ping the target machine? If both machines have an IP address, try pinging the machine in question. Ping sends a test signal to a given machine or IP address and listens for an answer. Simply type PING <address> at the command prompt — for instance, to ping a machine at 192.168.0.2 you'd type PING 192.168.0.2. If you get "Connection timed out" or some other error, then the two machines aren't talking to each other at all, and there is some fundamental low-level network problem that needs to be resolved first.

Can both machines ping themselves? This is a good way to determine if there is some low-level problem with the network stack in either of the machines in question. Use the command PING 127.0.0.1 or PING localhost to make the machine ping itself. If there's no answer, then something is very wrong with the computer's network stack, and it may need to be removed and reinstalled.

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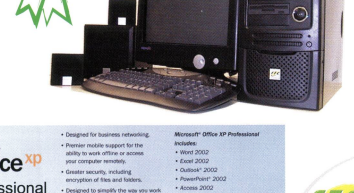
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Up and running with Mandrake Linux 9

Load this month's bonus cover CD, follow our expert's tips and get into Mandrake 9!

***Matt Overington* leads the way.**

The first step on the road to Linux bliss is partitioning your hard disk and preparing for the Mandrake installation.

There's a good chance that you'll already have Windows running on your computer. If so, your installation options will fall under one of the following four categories: delete Windows and use the entire primary drive for Linux; re-partition the drive and dual-boot Windows and Linux; install Linux to an existing partition and dual boot; or finally install Linux to a secondary hard disk separate to the Windows drive.

The installation method for each is slightly different, although each will leave you with a fully functional version of Linux.

LAYING THE GROUNDWORK FOR LINUX

One thing before starting the installation process is to make sure that all your settings and vital data are backed up. Firstly, boot into Windows and backup all the important stuff on your drive onto a few CD-Rs. If you don't have access to a burner, try a Zip drive or other form of removable media (almost all have drivers for Linux), or in case of emergency a pile of floppies will suffice.

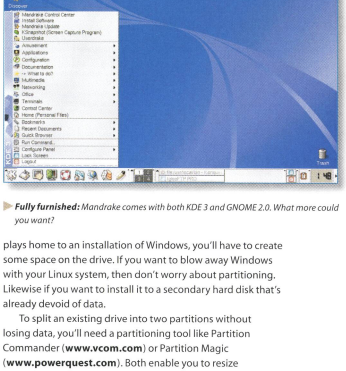
Open Internet Explorer and select Internet Options under the Tools menu. Note down all your settings from under the Connections tab onto a piece of paper: you'll need those later. Also grab any settings for your dialup adaptor from the Control Panel: you need telephone number, login name and password.

If you're on a LAN connection, go to the Control Panel and select Network Connections. Right click on your adaptor and go to Properties. Select TCP/IP (assuming you are on a network that uses TCP/IP), and click on Properties again. Note any IP and DNS settings and close the dialog boxes.

Do the same for your email program: record POP3/SMTP settings and details of your mail accounts. This will ensure that even if everything goes pear-shaped, you'll still be able to piece together a working system without losing any vital data.

After storing this critical information — and doing a final check over the hard disk to make sure there are no crucial spreadsheets, photos, or documents left — you're ready to install Mandrake Linux. Starting out with an entirely new Operating System can be devastating if you've left some important data on the old system and it only takes a moment to double check.

If you intend to install Linux on a hard disk that already plays home to an installation of Windows, you'll have to create some space on the drive. If you want to blow away Windows with your Linux system, then don't worry about partitioning. Likewise if you want to install it to a secondary hard disk that's already devoid of data.



Fully furnished: *Mandrake comes with both KDE 3 and GNOME 2.0. What more could you want?*

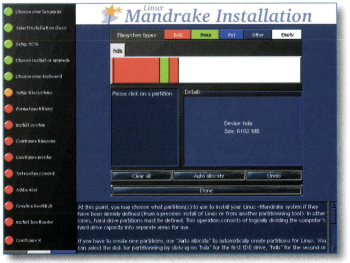
To split an existing drive into two partitions without losing data, you'll need a partitioning tool like Partition Commander (**www.vcom.com**) or Partition Magic (**www.powerquest.com**). Both enable you to resize partitions on a hard disk without deleting the information from any existing partitions. This means that you can set up Linux and Windows to share the same hard disk, so when you boot you can choose between them.

INSTALLING MANDRAKE 9

Using an entire drive for Linux is by far the easiest, and is for those willing to leave Windows behind entirely to step into the vastly cheaper and infinitely more rewarding world of Linux. The following instructions will work if you want to start from scratch, maintain your Windows partition, or install Linux to an entirely new drive.

If you have a bootable CD-ROM drive, put the Mandrake Linux installer CD into the CD-ROM drive and reboot the computer. If you don't, you'll have to create a boot disk to continue (see page 125). Boot from the Mandrake CD and the Mandrake Installer, DrakX, will load. Press Enter to continue entering the installer.

Configuring the language The first screen you are presented with is for configuring the language. Unless you're particularly attached to American English, we suggest using



DrakX: *the Mandrake Installer helps make loading Mandrake Linux a snap.*

the Queen's English. It means that your spell checker won't keep tripping over certain words. You can always select multiple languages by clicking on the Advanced button at the bottom of the screen. When you've got your languages correctly configured, advance to selecting your region, and then on to the License screen.

Unless you are upgrading an existing version of Mandrake Linux, you'll want to select the Install option after agreeing to the terms and conditions of the licence. *APC* recommends that you use the standard installation method instead of the expert mode, which will provide slightly more advanced partitioning options. You'll have to configure your mouse and keyboard, both of which are usually autodetected successfully by DrakX.

Support for the latest multibutton mice with scroll-wheels is incorporated, so you don't have to worry about not being able to use that new whiz-bang cordless optical mouse you've been proudly showing off to the entire office.

Partitioning If you want to say goodbye to Windows and use the entire disk for Linux, click on Erase Entire Disk. If you'd rather take care of setting up your drives yourself, select the option titled Custom disk partitioning.

A graphical representation of your hard disks is presented on screen. All free space will be shown in white. Click on a section of unpartitioned space and then on the Create button. Set the size of the partition using the slider, and then select the mount point (if it's your primary Linux disk, select / as the mount point). You'll also have to create a swap drive, so make sure that you leave approximately 300 to 500MB of space free.

If you still have free unpartitioned space, you can add extra drives by clicking on the white blocks and selecting Create. Extra drives can be mounted to any directory, but remember to use NTFS or FAT32 as a file system if you want the drive accessible from both Windows and Linux.

Auto-allocate If partitioning is too complicated, you can always opt to auto-allocate the drive space by pressing the corresponding button under the Custom disk partitioning screen. When you're ready to move on to formatting and setting up the system, click Done.

Any newly defined partitions will now be formatted with the appropriate file systems. This will take a few minutes.

Configure the packages to install This will largely depend on the function of the computer. The computer can be configured using one of a number of workstation or server setups. You can also select the packages individually.

We've bundled both the first and second Mandrake installer CDs onto this month's cover, so you are free to choose any packages to install at this stage. The role of the computer will determine the packages you opt to drop onto your drive. Bear in mind that you can always add more packages later on if your primary choices aren't quite right.

APC recommends installing the Office Workstation, Multimedia Station, Internet Station, Console Tools and Configuration packages with both KDE and GNOME.

After configuring the packages you want to use, click through to the next screen to start transferring them to your system.

SETTING UP MANDRAKE 9

After the packages have been installed on your system, the next stage is to configure some of the basic system elements.

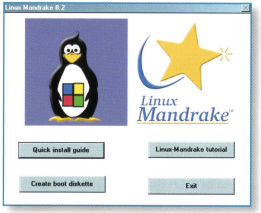
Setting a root password The root account is used for configuring the system or performing maintenance tasks. This is like an administrator account under Windows. After you've entered the password, you can add users to the system. Enter

Mandrake Installer Boot Disk

If you don't have a bootable CD-ROM drive, you'll want to configure a Mandrake boot floppy so you can commence the installation process from the CD-ROM.

Boot your computer into Windows and insert the Mandrake Linux CD-ROM into the drive. If the CD doesn't autorun, click the My Computer icon on your desktop and click on the CD-ROM drive. Slip a blank floppy into your floppy drive and click the button labelled Create Boot Diskette. This will write the contents of the CD-ROM loader onto the floppy. You can then reboot the computer — with the floppy in the drive — and commence installation.

If this method doesn't work, try creating the boot disk manually. Boot into Windows and insert the Mandrake Linux installation CD into the CD-ROM drive. Close the auto start window and navigate to My Computer on the desktop. Right click on the CD-ROM drive and select Open from the menu. Open the folder entitled dosutils, and double-click on the rawwritewin icon to open the raw floppy disk writer. Slip a blank floppy disk into the drive and select ***X:\images\cdrom.img*** *under the Image File field (where X is the letter of your CD-ROM drive). For the Floppy Drive field, select drive A:, and then click on Write.*



Adios Windows: *Mandrake installer enables you to perform a variety of tasks under Windows ... before replacing it.*

separate logon details for each person that will be using your computer — including yourself.

You'll use this account and not the root account most of the time, which enhances system security. Clicking the Advanced button will let you specify each user's default shell. Most of the time you'll want to use "bash" (Bourne-Again SHell), as it's now the de facto standard.

After you've finished setting up all the individual users of the computer, you can move to the next screen, where you configure your default window manager. You can choose between version 3 of KDE, GNOME 2.0 or IceWM, although each user can specify their own default.

Networking components' config The next screen handles the configuration of your networking components. Generally the best bet will be to check the button labelled Use auto detection.

If you opt for autodetection, a screen is displayed where you can select the type of network connection you use. Select between modem, LAN, ISDN, ADSL or Cable connections and click through to the next screen. A network card detection script is run and you'll be presented with a screen displaying your options.

Any wireless cards will also be detected automatically. Enter any network details on screen — the same ones you painstakingly copied from Windows earlier — and click OK to continue.

If you make a mistake, don't worry; you can always opt to change the settings later.

Summary screen One of the best features of the DrakX installer is the summary screen. After you've finished entering your networking details, you are shown a final screen that lists the options that you have selected. You can make any final changes to your system as required, or set up a printer.

If you have a printer to configure, DrakX will poll the ports on your PC, and then look across the network for any printers that can be used. You'll be informed if there are no printers present.

Configure a boot disk Moving on, you'll have to configure a boot disk (if you have opted to dual-boot your machine). It's easy to skip the creation of the boot disk, but we highly recommend making one. You never know when you may need it.

If you are only running a single operating system, then you'll obviously not require a boot loader as you'll only have Linux to boot into anyway.

X-Windows configuration screen After the boot disk is configured, you move onto the X-Windows configuration screen. Here it's generally best to opt for the same settings as Windows. If you generally run Windows in 1,024 x 768 with a colour depth of 16.7 million colours, then do the same with Linux. A test screen is displayed just in case you select the wrong options for your system, so you can double check before committing the settings to the disk.

INTERNET UPDATES

If you have a stable Internet connection (as configured earlier), the final step in the installation process is installing Internet updates for Mandrake.

Given that Mandrake Linux 9.0 was only released in September 2002, however, there is the chance that no updates will be available yet. Now you are ready to reboot and experience Linux using the power and elegance of Mandrake 9.

CrossOver Office

Hate it, love it, or remain apathetic about it, Microsoft Office is the standard for office productivity software. Most would agree that Office is a good product; a little kludgy and eclectic at times, but a valuable business tool nonetheless.

Although Mandrake Linux includes OpenOffice.org 1.0.1, it is not 100% compatible with Microsoft Office documents, and occasionally you will need to use the real deal to edit a file. Also, if you are working in a corporate environment that relies on Microsoft Exchange for email, you will be disadvantaged if you don't have Outlook on your PC.

CrossOver Office leverages technology pioneered by the Wine Project (**www.winehq.com**) and enables you to run Microsoft Office 97 or 2000 on your Linux box. It works as a translation layer so that the Windows-native code will work under Linux. It is a touch expensive at US$54.95, but could be invaluable for those that are bound to Microsoft applications.

If you want more broad application support, and want to run Windows programs other that Microsoft office, you'd be better off looking at VMWare (**www.vmware.com**) or Win4Lin (**www.netraverse.com**).

If Linux has everything that you need except Microsoft Office, then CrossOver Office could be just what you need.



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Remote possibilities

There's plenty of PC power sitting idle on your home or office network. *Serdar Yegulalp* shows you how to tap into it with Windows.

Terminal Services and the Remote Desktop are concepts borrowed from the Unix world. When you want to run a graphical desktop in Unix, you run a program (called the X Windowing System) which communicates with the kernel through a messaging subsystem or through a network protocol to perform graphics functions. Within this environment you can run your choice of window managers or graphical applications.

The intriguing thing is that X doesn't have to run on the same machine, since it can talk over the network to any other machine. In the same way, Windows 2000's Terminal Services and Windows XP's Remote Desktop use a tiny program to talk to the server and present a graphic replica of that remote machine's desktop.

The machine you're running the terminal client program on only has to have networking and some graphics support, and there are versions of the client for every version of Windows, including Windows 3.1. This makes it possible to take a relatively decrepit machine and use it as a way to leverage the power of a more state-of-the-art one.

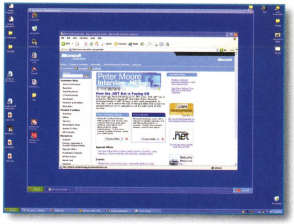
The type of machine that hosts a Terminal Services or Remote Desktop session should be pretty solid, however. You'll want nothing less than a 1GHz processor, with at least 192MB for two users and an additional 32MB for each additional user that will be present at any given time.

INSTALLING TERMINAL SERVICES

Setting up Terminal Services in Windows 2000 is simple enough. Under Add/Remove Programs, select Add/Remove Windows Components and check off Terminal Services. The Terminal Services Licensing component isn't needed unless you're using Terminal Services to run applications remotely.

Installing that requires you buy a licence from Microsoft, depending on how you have your server configured, but odds are you won't be doing that. By default, Windows 2000 Server comes with five Client Access Licenses — meaning that up to five users can log in simultaneously and make use of the system. If you need to have access for more users at once, you'll have to buy that.

Once the component is installed, you'll need to build disks to install the client access program. Look in the Programs, Administrative Tools group for the Terminal Services Client Creator and run that. Depending on what version of Windows you're using to access the remote system with, you'll either need to build 16-bit clients (for Windows 3.x) or 32-bit clients (for all other versions of Windows).



***XPdient:** a remote desktop to a Windows XP Professional computer from a Windows XP Home computer. The remote computer can also be set to display in full-screen mode, as if we were working directly on the machine.*

ACCESS ALL AREAS

After you create the floppies, you can copy the files off them and put them on a shared network drive if you like; they don't have to be installed from the disks themselves. Launch the program, type in the IP address or the machine name of the computer to connect to, and hit Connect.

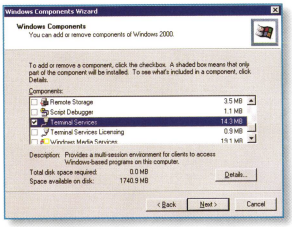
With Windows XP, Terminal Services is called Remote Desktop and is part of the package, although you'll need the enhanced Remote Desktop capabilities of Windows XP Professional rather than the Home edition to pull off the things described here.

To enable Remote Desktop, right-click on My Computer and select Properties, Remote. Uncheck Allow users to connect remotely to this computer, and click Select Remote Users if you want to deny or grant access to specific users. By default all users in the Administrators group are given access.

To access a Remote Desktop machine from another XP machine, look in Programs, Accessories, Communications for the Remote Desktop Connection tool. Launch it and type the name or IP address of the computer you're connecting to and hit Connect.

If you're using Remote Desktop and want the remote computer display to work in full-screen mode, as if you're sitting right at the computer, click on the Options button, then the Display tab, and move the Remote Desktop Size slider all the way to the right. To switch in and out of full screen mode, move the mouse all the way to the top middle of the screen and click either the Minimize icon or the icon to restore the original window shape.

If for some reason you can't connect to the server, there may be several things you need to consider:



Server side up: *Terminal Services in Add/Remove Windows Components sets up Terminal Services on a Windows 2000 Server computer.*

- Make sure you can ping the Terminal Server or Remote Desktop machine once you know the IP address, just to see if there's connectivity between them. If you can't even do that, then something's wrong with the network connection.
- You can't connect to a Terminal Services or Remote Desktop machine that's firewalled. Unless the firewall allows port 3389 to work in both directions, you won't be able to connect. On the other hand, you may want to ensure that people cannot connect from outside your home or organisation and hijack your machine! As a rule of thumb if you have an inhouse network, don't bother firewalling between machines; just firewall the gateway to the Internet.
- If you can't find the machine by its machine name, try the IP address. Sometimes the NetBIOS name for the machine doesn't propagate immediately. To learn a machine's IP address, start a command-line session by typing CMD in the Run box, and then type IPCONFIG from the command line.

GETTING TO WORK

Now that you have the connectivity for your Terminal Server or Remote Desktop, what can you do with it?

Use remote applications that can't be installed on other computers This is one of the most obvious uses for TS/RA, and in fact there is a specific mode for Terminal Services called Remote Application Mode. I mentioned earlier that you cannot use this mode without licensing it specifically, however, so instead I'm going to concentrate on what you can do by simply connecting remotely.

For one, there may be programs which simply will not run on a machine that does not have a certain amount of memory or disk space. If you want to make an application like that available to multiple users without upgrading each and every other computer, install it once on your server and allow users to run it in Terminal Services.

However, you need to keep in mind that there are many applications which don't lend themselves to being run by multiple users at once. You may want to either experiment to see which applications can allow this, or only allow access to the program by certain people at certain time periods to avoid possible conflicts.

Another possible way to make use of this is with programs that have licensing restrictions — for instance, a hardware key that forbids it from being run on more than one computer. Users may still have to take turns with it, but at least this way the key doesn't have to be passed tediously from machine to machine to make it work.

Create a "headless" house server Another common use for Terminal Services or Remote Desktop is to use it to access a "headless" server. As of late, the term "headless" has been taken from horsemen and applied to servers that have no video card, keyboard or mouse. All access to the server is done through the network.

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Any administrative tasks are performed using a remote desktop. Headless servers have the advantage of being cheaper and can often take up much less space, since a keyboard, mouse and display aren't needed for that machine.

Headless servers are very popular in organisations that have many rack-mounted servers — many of which have no video or keyboard hook-ups, just network ports. If you want to create a headless server, borrow a display and keyboard/mouse from another machine, and then remove them when you no longer need them. You'll still need a video card, you just don't need to have a display plugged into it.

One thing to be very careful about if you decide to set up a headless server: don't install firewalls or other network filtering applications remotely or you'll lose access. You'll need to set them up locally with a local mouse, keyboard and display, or you risk locking yourself out of your own computer.

This goes double for a remotely-hosted machine where you have no direct physical access to the box. Firewall software generally blocks everything by default. If you can pre-emptively open port 3389 before starting the firewall, you should be able to keep yourself from getting locked out.

CHECKLIST

Here's a quick checklist of other things to keep in mind when using Terminal Services or Remote Desktop:

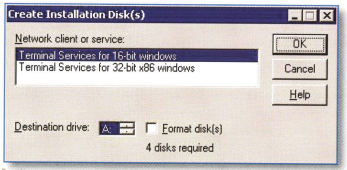
Check licensing on apps and OS As I've mentioned previously in this article, if you use Windows 2000 in Terminal Services mode, you can only make up to five simultaneous connections to it by default. Normally this is not a problem, but if you plan on having more than five people connect at once, you'll need to purchase additional client access licenses.

Also note that some applications also require special licensing to work with more than one user (or more than the basic number of users they're licensed for out of the box).

Set proper network bandwidth settings Even on a LAN you want to keep the amount of traffic to a minimum — turn off desktops, sounds, etc. To do this from the Remote Desktop client:

1. Click on Options, select Experience, and uncheck everything except Bitmap Caching, which speeds up connectivity by locally caching copies of commonly-used images.
2. Click on Local Resources and set Remote Computer Sound to Do not play.

Permissions Use permissions to lock out access to app installations or other things that should not be allowed by the users in question. Don't allow app installations by users that are not administrators. Set any user account that logs in as either a Guest or a regular User account, not a Power User or Administrator. (You may need to install programs as an Administrator, however.)



Client Creator: *build client disks for 16- or 32-bit Windows. There's also a downloadable Mac OS X client.*

Leverage less powerful machines for Web surfing/mail
This is probably one of the best ways to make use of Terminal Services or Remote Desktop. If you have an older machine that run Windows 95 (barely) and you want to use it for Web surfing or email, you can use TS/RD to do that. Internet Explorer and Outlook Express — to name two such programs — are inherently multiuser and can be used by more than one person at a time.

Since those programs generally have fairly low overhead, it's not a burden to run multiple instances at the same time for different users.

WHAT NOT TO DO!
Not everything is suited to being run remotely. Here are some applications that should not be run over a Terminal Services or Remote Desktop connection under any circumstances.

Games, especially those requiring fast video All video events use up a certain percentage of CPU and network bandwidth, to say nothing of the CPU used by the game itself. Unless you're talking about a game which is mainly passive (such as a computer version of a board game or a text-based game), don't run games through a TS/RD connection as they can bring everything to a grinding halt.

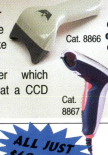
Applications that use video Another no-no for the reasons cited above. This includes applications like QuickTime, RealPlayer, Windows Media Player and any of their ilk, as well as video plug-ins or Flash animations on Web pages.

Applications that use sound Sound is less onerous than video, but it still requires a certain percentage of the network and doesn't sound anywhere nearly as good over a TS/RD connection. The terminal program downsamples the audio to make it take up less bandwidth, so the results are often tinny and low-resolution. If you want to run sound, run it locally.

Applications not suited for multiple users I touched on this before, but you should always test any application to make sure it can be run by multiple users at once without ill effects. Some programs are not written to be used by more than one person at a time — one person may wind up overwriting another person's configuration, for instance, unless the program is smart enough to store each user's settings separately in the Registry. EOTP

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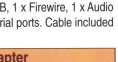
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SWiSH animations in a Flash

If you're looking for a fast, affordable way to create Flash text animations, why don't you give SWiSH a try? *David Emberton* explains.

Flash is a powerful tool, but sometimes all that power gets in the way of the simplest tasks. Consider text animations — a neat way to give your Web site a little extra pizazz. The process of managing each individual letter in Flash is cumbersome and time consuming. And Flash's scripted text animation makes it difficult to account for kerning and spacing differences between characters.

That's when you'll want to reach for SWiSH. It's a locally-developed program specifically designed for streamlining common text animation tasks and rolling ready-made effects in Flash-compatible SWF format. For example, it can take an hour to produce a text effect such as a wave in Flash, but it takes seconds in SWiSH.

And if text animations are all you want, then you'll find that SWiSH is also a lot cheaper than Flash. **In fact, it's free on this month's cover CD!** We've included a full working version of SWiSH 1.5.2, which is also called SWiSH Lite. SWiSH has everything you need to produce professional Flash text effects in a fraction of the time of Flash itself.



***Warped:** a typical example of what can be achieved with SWiSH.*

Overall, SWiSH 1.5.2 doesn't have the features of a full-blown animation program, but the latest version SWiSH 2.0 enjoys a more comprehensive feature set such as shape drawing tools and enhanced scripting abilities. (You can upgrade to SWiSH 2 at a 10% discount using the offer on this month's cover CD and logging on to **www.swishzone.com/apc.html**).

FROM SWISH TO FLASH

Because Flash Player is backward compatible, rival software makers seized the opportunity to make their own products export to SWF format. At the same time, SWF remains a proprietary binary format which makes it fairly difficult to clone or reverse engineer.

It's important to note that a SWF file is just a flattened end product, with all the niceties of authoring, like key frames and layers, stripped out for the sake of efficiency. SWiSH animations are saved in its own SWI format, which can then be converted into SWF and read by other Flash-enabled apps like Flash Player.

BUILDING ANIMATION WITH SWISH

SWiSH has a wizard interface which lets you crank out fast text effects such as Vortex, Wave, 3D Spin and Slide. It also supports all the scripting of Flash 3, plus the ability to include imported images and MP3-compressed audio.

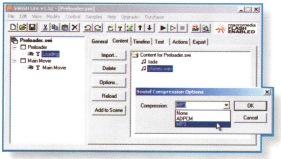
The SWiSH wizard, which doesn't need to be followed in a strictly linear fashion, is comprised of six tabs: **General, Content, Timeline, Scene, Actions** and **Export**. Text objects, scenes and images are added to a movie using the toolbar buttons, and then edited using the wizard tabs.

General This sets out the size, frame rate and background colour of the animation. When you start up SWiSH, a blank white rectangular window appears. This is the preview/editing window; it allows you to move things around and also view playback. The size and properties of this preview/editing window reflect the General tab settings.

Content Although SWiSH animations usually contain text objects, the Content tab can be used to import images and sounds and set their compression options. SWiSH can import GIF, JPEG and PNG images, as well as MP3 and WAV audio. Audio can be compressed using the super-efficient MP3 codec, or the older-style ADCPM. MP3 is recommended.

Timeline The Timeline tab is somewhat similar to the Macromedia Flash timeline, but simpler. It revolves around adding frame actions (like Stop, or Play), and object effects. Once an effect is added to a piece of text, dragging can alter the length of the effect and its position on the timeline. Effect settings can also be customised by double-clicking.

One important aspect of the SWiSH timeline is that objects persist throughout the entire animation. This can be a little confusing since apparently "empty frames" are really just frames without any effects applied to them. To obscure an object on a portion of the timeline, use the Hide effect.



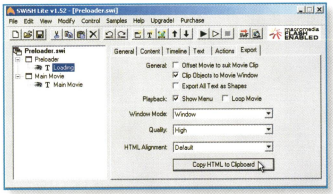
***Sounds good:** import a variety of image and sound files for integration into a movie.*

Text SWiSH's simple text object editor controls typeface, font size, kerning, colour and leading. By default, text is exported as an optimised set of character outlines, and references to those outlines thereafter. So, you can use the letter "e" in a particular font 100 times, and the character itself will only be stored once in the SWF file. In some cases, such as importing Wingdings characters back into Flash, it's a good idea to export text objects as discreet graphics. The Text tab makes this possible via the Export as Shapes option.

Actions As mentioned earlier, SWiSH includes the full set of Flash 3 Actions. These aren't comparable to Flash's new ActionScript language, but they can be used to build rudimentary interaction and preload control. Actions can be assigned to frames, or to objects. Objects that are assigned actions become buttons, and can be set to respond to a variety of mouse events, such as clicks or rollovers.

Export On this tab you can set various minor options relating to how the SWF file and optional HTML document are laid out. The most important setting is Offset Movie to Suit Movie Clip. If you intend to import your animation into a Flash Movie Clip symbol, check this option so the objects will align properly to the symbol's registration point (usually the centre point). If you intend to use the animation solo, uncheck the offset box.

Also on the Export tab is the Copy HTML to Clipboard button. Rather than publishing an HTML file just to open it up, copy and paste the code into Dreamweaver — you can send the code straight to the clipboard and paste from there.



***Export tab**: this allows Flash Player HTML code to be sent straight to the clipboard.*

```
<object classid="clsid:D27CDB6E-AE6D-11cf-96B8-
444553540000" codebase="http://download.macromedia.com/
pub/shockwave/cabs/flash/swflash.cab#version=4,0,0,0"
 width="100" height="100" border="0" vspace="0" hspace="0"
name="myanimation">
 <param name="movie" value="myanimation.swf">
 <param name="quality" value="high">
 <param name="bgcolor" value="#FFFFFF">
 <embed src="myanimation.swf" quality="high"
pluginspage="http://www.macromedia.com/shockwave/
download/index.cgi?P1_Prod_Version=ShockwaveFlash"
 type="application/x-shockwave-flash" width="100"
height="100" border="0" name="myanimation" vspace="0"
hspace="0" bgcolor="#FFFFFF">
 </embed>
</object>
```

This code snippet can also be auto-generated by SWiSH's File, Publish command. (Notice that SWiSH animations are playable in Flash Player 4.)

By nesting the plug-in tag (embed) inside that of the ActiveX control (object), the appropriate version of the Flash Player will be activated in the browser. For Player version detection, visit (**www.macromedia.com/support/flash**). SWF files can also be imported into Flash, but because SWF is a flattened format, tweens, object colouring and other effects will not be editable without altering each individual frame.

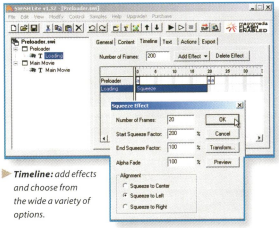
To bring a SWiSH animation into Flash, first export it from SWiSH as an SWF file, then use Flash's File, Import command. If you're using Flash MX, the Import to Library command can bring SWF animations in as a symbol, rather than dumping all the raw frames in the current timeline; handy for just altering or scripting content.

Because of its very basic support for Actions and its focus on text animation, SWiSH only has a specific usefulness. In many cases you'll still need Macromedia Flash in order to integrate the results into your site, especially if you need sophisticated scripting or more than simple interactivity.

Additionally, SWiSH uses key framed animation. This means that longer animations, and animations containing several objects, will be bigger and less modem-friendly (at least, for dialup users) than shorter, simpler ones. So be sure to experiment with the exported file size of your animations and test them over a regular modem. CTTC

GETTING SWISH ONLINE

To publish a SWiSH-generated animation to the Web, use an HTML editor to embed the SWF file. Newer versions of Internet Explorer for Windows don't support Netscape plug-ins, so be sure to use embed and object tags like so:



***Timeline:** add effects and choose from the wide a variety of options.*

Position perfect with CSS

CSS positioning can streamline your HTML and style-up your site. *Steven Noble* explains.

Cascading Style Sheets (CSS) let you clean up your code, while a single, logical CSS sheet will arrange and decorate your entire site. So, if you're tired of mangling your site's HTML code with nested tables, invisible GIFs and other tag terrors, this could be the answer.

For this Workshop you'll need a text editor, such as Windows' NotePad, Mac OS's SimpleText, Mac OS X's TextEdit or Unix's Pico. If your text editor can generate any text format other than plain text, adjust its preferences so it only produces plain text while you're using it as a CSS/HTML editor. Also test your style sheets with the Mozilla browser. Mozilla does a good job of interpreting CSS on a wide range of platforms, and you'll find it on this month's cover CD.

STRUCTURE

To begin, create the outline of an HTML document, with the standard <head> and <body> areas. As this Workshop uses some of the latest Web standards, use HTML 4.01 Strict as your doctype. If you don't know how to do this, just copy css_step_1.html, which is on this month's cover CD.

The DOS-, Mac- and Unix-line-break versions on the cover CD are identical except for the invisible character inserted when you press your keyboard's return key. Using the "wrong" version will not confuse your Web browser, but it could cause your text editor to display all the document's text on a single line.

Insert the text for your Web site into the <body> area of your HTML file. You'll find the text file that was used — macbeth.txt — on this month's cover CD.

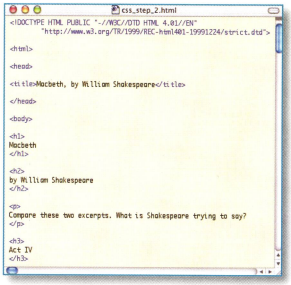
Markup *"Macbeth"* with the <h1> tag, "by William Shakespeare" with the <h2> tag, each Act number with the <h3> tag, each Scene number with the <h4> tag, each character who speaks with the <h5> tag, and all other text with the <p> tag. Use the
 tag to force lines breaks within each stanza of the witches' spell.

These simple HTML tags describe the structure of the document, not its appearance. They say "this is a headline, that is a paragraph," not "make this big and red, make that small and blue". When finished, your file should look like css_step_2.html on the cover CD. Drag the file onto Mozilla to see how this browser will display a well-structured but undecorated HTML document.

DECORATE

Adding an internal style sheet will decorate the text in your HTML file. To add the style sheet, put the following tags in the <head> area of your HTML document:

```
<style type="text/css">
<!--
--!>
</style>
```



▶ ***Clean as a whistle:*** *basic, structural HTML tags do not needlessly complicate your markup.*

The <style> tag marks the beginning of your internal style sheet, while the comment tags ("<!--" and "--!>") ensure that old Web browsers that were released before CSS will ignore your style sheet. This style sheet can be used to set the font size, line height and margins for every text element in the page. This is because the height of these elements will affect the size — and therefore the positioning — of their "parent" elements: the blocks to be introduced later in the Workshop.

In the style sheet, type the following CSS declaration:

```
p { line-height: 150%; }
```

This says that each line of <p> should be 150% of the height of the font used for <p>. The line height is set explicitly, as different Web browsers would calculate the line-height differently if this was left up to them.

According to the CSS spec, elements like <h5> should inherit their line height value from their parent element, <p>. However, some buggy browsers do not handle inheritance well, so add identical line-height declarations for the <h5>, <h4>, <h3> and <h2> tags to your style sheet. Set the line height of <h1> text to 100%, as <h1> headings are so big that they occupy more "screen real estate" than they have to.

Next, make the <h1> heading four times the size of normal paragraph text, by adding this declaration to your style sheet:

> ***Don't forget the comments:*** *older browsers like NCSA Mosaic 1.x will mistakenly display your style sheet as text, unless you hide it with HTML comments.*

```
h1 { font-size: 400%; }
```

Again, unless you explicitly declare the font size for <h1>, you'll find that Web browsers vary in how large they display <h1> headings. Use similar declarations to set <h2> to 200%, <h3> and <h4> to 150%, and <h5> to 100% — the same size as normal paragraph text.

Next, ensure there isn't unwanted space around our <h1> heading with the following declaration:

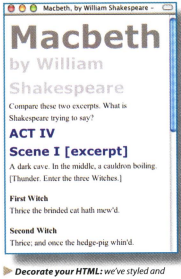
```
h1 { margin: 0; }
```

That's "margin: zero", not "margin: oh". Do the same for the <h2>, <h3>, <h4> and <p> tags.

It would be helpful to put a break between each paragraph of speech in *Macbeth* and the name of the next actor who speaks. You can do this by clearing the margin below <h5> while inserting a fixed-height break above it. So, add this rule to you style sheet:

```
h5 { margin-top: 1em; margin-bottom: 0; }
```

An em is the width of the letter M in standard paragraph text. Now, colour and style the text as you please. I've included CSS-style comments (between /* and */ delimiters) in css_step_3.html (on the cover CD) that explain how it colours and styles text.



> ***Decorate your HTML:*** *we've styled and coloured the text, and opened it in Mozilla.*

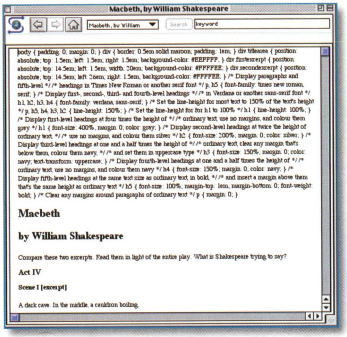
That file also demonstrates how CSS allows you to collapse several declarations into a single rule. Drag the file onto Mozilla. The text is now styled quite nicely, but the default top-to-bottom text flow of this HTML document has not been altered.

DIVIDE

Now, divide the text content of the HTML file into three text blocks that can be positioned in three places using CSS.

Markup the first few lines of the <body> of the HTML file so they look like this:

```
<div class='titlearea'>
<h1>Macbeth</h1>
<h2>by William Shakespeare</h2>
```




```
<p> Compare these two excerpts. What is Shakespeare trying
to say?</p>
</div>
```

In this example, these lines have been wrapped in a block, and given that the class name titlearea, which was invented for this purpose. Following the same process, wrap each of the two *Macbeth* excerpts in its own block. Include each excerpt's Act and Scene numbers within its block. Give these blocks the class names firstexcerpt and secondexcerpt, respectively.

Every part of the <body> of your HTML file should now be enclosed in a , with each ending just before the next one begins.

To take a closer look at our blocks, insert the following rule into your style sheet:

```
div { border: 0.5em solid maroon; }
```

This will give each a solid, maroon-coloured border that's half an em thick. Reload the page in Mozilla and you'll see how you've divided your text into three blocks. The text runs right to the borders of each , which is unsightly, so add the following declaration to your style sheet rule:

```
padding: 1em;
```

The padding declaration puts an em of clear space between the border of each and the text it contains.

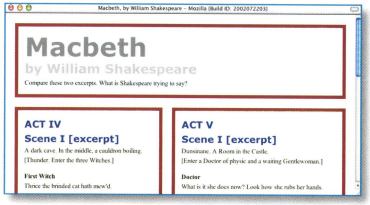
Drag css_step_4.html from the cover CD onto Mozilla to see the effect in action.

POSITION YOUR BLOCKS

Before implementing CSS positioning, remove any extra space from the edges of your document with the following rule:

```
body { margin: 0; padding: 0; }
```

Now you will give a unique position to each of the three blocks. Insert the following three rules into your style sheet:



Ain't that lovely: *our final layout, as viewed in Mozilla.*

```
div.titlearea {
        position: absolute;
        top: 1.5em;
        left: 1.5em;
        right: 1.5em; }
div.firstexcerpt {
        position: absolute;
        top: 14.5em;
        left: 1.5em;
        width: 20em; }
div.secondexcerpt {
        position: absolute;
        top: 14.5em;
        left: 26em;
        right: 1.5em; }
```

Each of these rules contains a {position: absolute;} declaration. This implements "absolute positioning", which is one of several forms of CSS positioning. As absolute positioning is being used, the Web browser will position each of these blocks in relation to its container element — the <html> tag, which represents the document as a whole. In other words, the {top: 1.5em;} declaration in the div.titlearea rule will position the top of this 1.5em below the top of the document.

Here's how to determine where to position the top of div.firstexcerpt and div.secondexcerpt: As long as the text in div.titlearea does not wrap, it will contain one line of <h1> text, one line of <h2> text and one line of <p> text. By definition, the height of <p> text is one em, while our style sheet says that the total line height of <p> text is 150% of its font height, or 1.5em. According to our style sheet, the heights of <h1> and <h2> are 4em (100% of 4em) and 3em (150% of 2em) respectively. Also, our style sheet clears the margins between <h1>, <h2> and <p>. So, the height of the text content within div.titlearea is 0em (margin) + 4em (h1) + 0em (margin) + 3em (h2) + 0em (margin) + 1.5em (h1) + 0em (margin) = 8.5em.

The text content of div.titlearea is surrounded by this block's 1em of padding, 0.5em border, and no margins. Therefore, the complete height of div.titlearea is 0em (margin) + 0.5em (border) + 1em (padding) + 8.5em (content area) +1em (padding) + 0.5em (border) + 0em (margin) = 11.5em.

For aesthetic reasons, the {top: 1.5em;} declaration has already been used to put 1.5em of clear space above div.titlearea. For visual consistency, the same amount of clear space is provided between div.titlearea and div.firstexcerpt. So, set firstexcerpt's top property to 1.5em (clear space above div.titlearea) + 11.5em (height of div.titlearea) + 1.5em (clear space below div.titlearea) = 14.5em.

Set the left property of div.firstexcerpt to 1.5em, so it aligns perfectly with div.titlearea and maintains the our 1.5em-of-clear-space layout effect.

Now give div.firstexcerpt's width property the value of 20em, which is wide enough so that none of the witches' stanzas are broken mid-line, but not so wide that it would waste screen space.

According to the CSS spec, 20em is the width of div.firstexcerpt's content area, which excludes this block's padding, margins and borders.

Calculate the value for div.secondexcerpt's left property, the same way as div.firstexcerpt and div.secondexcerpt's top properties. The equation is: 1.5em (clear space) + 0em (margin) + 0.5em (border) + 1em (padding) + 20em (content width of div.firstexcerpt) + 1em (padding) + 0.5 (border) + 0em (margin) + 1.5em (clear space) = 26em. Add {left: 26em;} to div.secondexcerpt's style sheet rule.

Last, insert a {right: 1.5em;} declaration into the div.titlearea and div.secondexcerpt rules to put 1.5em of clear space to the right side of these two blocks, maintaining the symmetry of our design.

Add some background colouring or other decoration to the rules if you wish. Then drag css_step_5.html from the cover CD to Mozilla to view the effect.

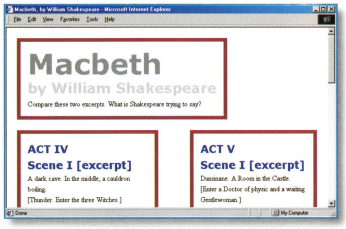
Try resizing your Web browser window. You will see that this layout is completely "liquid", meaning that it automatically rearranges itself to take advantage of the current window size. Now try increasing and decreasing your default font size. Thanks to our exclusive use of em as our unit of measurement, this layout automatically adjusts itself to accommodate any font size.

Now open the same file in an old Web browser like Netscape 3.x or NSCA Mosaic 1.x. You will see a perfectly readable, "vanilla" version of you Web site. Netscape 3.x does not know how to interpret your style sheet, so it simply ignores the CSS and presents you with the file's well-structured HTML. The screen-reading Web browsers used by visually challenged Net surfers will do the same.

EXTERNALISE YOUR STYLE SHEET

While Netscape 3.x is polite enough to acknowledge that it does not understand CSS, Netscape 4.x believes it does. This Workshop's layout is so simple that Netscape 4.x does a reasonable (but not perfect) job of interpreting it, but complex layouts that use a mix of absolute, relative and fixed positioning will look terrible in that Web browser.

The solution: take the separation between appearance



Botching the box model: *the buggy Internet Explorer 5.5 for Windows displays the box around Act IV Scene I with an incorrect content width.*

(CSS) and structured content (HTML) to its logical conclusion.

To begin, cut the style sheet (everything between the comment tags) from your HTML file and paste it in a new text file. Save this file as style.css in the same directory as your HTML file. All your decorative information is now in a separate file, while your HTML file is barely more complex than css_step_2.html, which contained no positioning or decorative information whatsoever.

Next, put the following code between the <style> and comment tags of every HTML file in your Web site:

```
@import url(style.css) screen;
```

Recent Web browsers understand the @import method, and will use style.css as your style sheet. Netscape 4.x does not understand the @import method, so it serves up a well-structured but undecorated HTML file. (You might want to change <body> to <body bgcolor="#FFFFFF"> to force a white background for Netscape 4.x.) Load css_step_6.html in Mozilla and Netscape 4.x to see the effect.

BOTCHING THE BOX MODEL

A number of Web browsers — most notoriously, the Windows version of Internet Explorer 5.5 — misinterpret the "box model" which is at the heart of CSS.

According to the CSS specifications, the width of a is the width of its content area. However, buggy browsers like IE 5.5 incorrectly apply the width property to the entire , including its borders and padding. For example, the width of div.firstexcerpt's content area should be 20em, according to our style sheet. But this has 0.5em borders and 1em padding, so when Explorer 5.5 incorrectly sets its entire width to 20em, the width of the content area will be just 17em.

In our simple layout, this will mangle the clear space that's been spread evenly throughout the site and come uncomfortably close to breaking the stanzas of the witches' spell midline. In more complex layouts, this bug could render your site unreadable.

Luckily, the "Box Model Hack" can be applied to our style sheet. To do this, replace the div.firstexcerpt rule in your style sheet with the two rules that follow:

```
div.firstexcerpt {
        position: absolute;
        top: 14.5em;
        left: 1.5em;
        width:23em;
        voice-family: "\"}\"";
        voice-family: inherit;
        width:20em; }
html>body div.firstexcerpt { width: 20em; }
```

Every browser that encounters these two rules will start by loading the incorrect width of 23em. In the buggy IE 5.5, this will result in a correct content width of 20em, as 0.5em (border) + 1em (padding) + 20em (content width) + 1em (padding) + 0.5em (margin) = 23em.

Buggy browsers will choke on the voice-family property (which is used to tell screen-reading software whether to speak the site's content with a male or female voice). Those browsers will load no more data from the first rule, and will apply the 23em width. Non-buggy browsers will digest the voice-family declaration, and then load the correct content width: 20em.

The second rule is purely for the benefit of Opera 5 for Windows. This browser will choke on the voice-family property, but it doesn't botch up the box model, so another way of feeding it the correct width must be found.

The html>body div.firstexcerpt selector takes care of this. Opera 5 understands that this means "apply this rule to div.firstexcerpt whenever it is a child of HTML's <body> element" (which it always is), so it will apply the correct content width of 20em to that block. The other browsers that don't understand the voice-family property also won't understand the html>body div.firstexcerpt selector, and will bypass the second rule.

Drag css_step_7.html from the cover CD to Mozilla, IE 5.5 for Windows and Opera 5 for Windows to confirm that the widths display correctly in all browsers.

CSS positioning resources

http://brainjar.com/css/positioning
A detailed explanation of key CSS positioning concepts, including floats and relative and fixed positioning.

http://thenoodleincident.com/tutorials/box_lesson/workarounds.html
Workarounds for many CSS positioning bugs.

http://glish.com/css/home.asp
Free Web site templates that use CSS positioning.

http://w3.org/TR/CSS21
Refer to the CSS2.1 specification whenever you get stuck.

http://Webstandards.org/act/campaign/buc/tips.html
Don't downgrade your code for buggy browsers — encourage users to upgrade their browsers instead.

Perls of wisdom

Installing Perl script on your Web server was never this easy. *Matt Overington* guides you through.

Perl drives the Web. Much of the back end grunt work that goes on when you order a CD online is performed by Perl, or one of its cousins. Leveraging the power of server-side scripting languages will transform your Web site from static text and images to an interactive experience.

Many view Perl as just an industrial-strength scripting language as opposed to a programming language with its own strengths and weaknesses. In reality, it's a flexible and extensible language that is particularly good at text manipulation and handling strings.

Larry Wall, Perl's eccentric creator, is an avid open source advocate and has worked to ensure that Perl complies to the GNU Public License. It's available for a wide range of platforms: Mac OS, Unix, Linux, FreeBSD, OS/2 and Windows, and is commonly used on a Web server as an interface between a client's browser and the Web site back end. Perl can be used as a server-side scripting language to perform all manner of manipulations to data entered on a Web form.

Client-side scripting languages, such as JavaScript, run on the client, and as such can only be used to access data that is on the client machine. The local date, system statistics and other information can all be accessed with client-side scripts, but if you want any processing done remotely, you will have to use a server-side scripting language like Perl.

One of the most common applications for Perl is as an intermediary layer between a client browser interface and a server-side database. One advantage of Perl over some of its counterparts is that it can leverage C source: it can access C libraries and execute the code contained within.

As Perl is often used as a scripting language to drive Web site back ends, *APC* thought it would be a good idea to illustrate how to install a Perl script onto a Web server. This tutorial assumes that your Web server has already installed Perl 5.2 or later.

Most ISVs will have Perl installed on their systems, but if you are unsure, an email to your service provider's helpdesk regarding the running version will allay any fears of incompatibility — or worse, lack of Perl support.



String of Perls: *Perl is a flexible programming language with a penchant for strings; it's best used in text-heavy environments.*

INSTALLING ACTIVEPERL

Before publishing anything online you'll have to write your Perl code. **To assist you, the latest copy of ActivePerl is on this month's cover CD**. Also, if your Perl is not up to scratch, check the box on the facing page for some links of Web sites.

If you're using Linux, there's a good chance that your Linux build already has a version of Perl installed. Open a shell and enter "which perl" at the command prompt. This will report Perl's version number, provided it is already installed on the system. If you don't already have a working version of Perl on your machine, don't worry, we've stuck it on this month's cover CD.

If you have a Linux distro that handles Red Hat Package Manager (RPM), double click on the RPM in the Workshop section to start the installer. Red Hat, Mandrake, SuSE and many of the other modern Linux distros support RPMs, which are as easy to work with as most Windows installers. If your distro doesn't handle RPM, open the gzip version and run the install.sh script. Debian users can use the native DEB file instead of the gzip version.

Installing ActivePerl under Windows is just as easy. Load this month's cover CD and navigate to the Workshop section. If you are running Windows 98 or Me, make sure that you have support for the Microsoft Installer on your system. If not, you can add it by clicking on InstMSI. Windows 2000 and XP come with it natively. With the installer in place, click on Active Perl 5.6 to install the relevant support files to Windows.

THE CODE

You will find a copy of the Perl program that we refer to here in the Workshop section of this month's *APC* cover CD. We recommend that you print it out using Notepad or any other text editor to use as a reference. The remainder of this article

refers mainly to the code, and if you're not experienced in Perl, it would help to have the script with you.

The first line of your Perl program will point to where your server has Perl installed. Check with your ISP, but it will generally look something like this: #!usr/bin/perl. After Perl's location is defined, you are free to start working with your program. Ours prints "Hello World" to the browser — it's far from exciting, but traditionally it's the first program entered into any new language.

Next we have to examine the query string sent from the browser. A query string is the information passed after the ? in a command when the script is called. For instance http://www.apcdemo.com/cgi-bin/script.cgi?exec. In this example, the query string is exec. Basically we want to structure our program such that it examines the query string, looking for exec. If it doesn't find exec or any version of it (Perl is case-sensitive), we have to construct an else clause to cover the contingency.

The following line looks for exec in any form, anywhere in a word, so we could even pass Execute, and it would still work. Checking for the query string is done using an if-else construction. If your program doesn't find exec in the query string, or if it wasn't even sent across from the browser, you will need to construct an else clause.

```
If ($ENV{'QUERY_STRING'} =~ /exec/i) {

}
```

You are free to create the main part of your program, which we have placed in its own subroutine. As it's only a single command, we don't really need to create its own subroutine, but as Perl is a procedural language, we may as well exploit it.

```
Sub HelloWorld {
        Print "Hello World\n<br>";
}
```

The subroutine is called with the command and HelloWorld, and it can be called either before or after the subroutine is defined in the code. Note that we can use HTML formatting within the quote marks.

You will also need to create a header subroutine, which is called whenever text or HTML is sent back to the browser from the Perl script. This is part of the CGI protocol, which you must adhere to if you want your programs to work correctly. The following subroutine is used to print a header, and is one of the most common and basic subroutines that you will have in your bag of tricks:

```
Sub header {
print "Content-type: text/html\n\n";
}
```

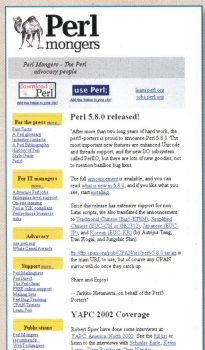
Perl on the Web

Perl enjoys an extremely strong online community base. Countless Web sites exist to help you learn and leverage it. So now, Perl proficiency is only a few clicks away:

www.perl.org
The main Perl hub. Here you can find the latest version of Perl straight from the horse's mouth. Also plays virtual home to a lively online community and features regular comments from Perl's author, Larry Wall.

www.perlxml.net/perl-xml-faq.dkb
The text-handling capabilities of Perl make it an excellent programming language to use in conjunction with XML. Perl and XML is a comprehensive site that covers many aspects of working with XML and Perl.

http://xml.com/pub/q/perlxml
The Complete List of Kip's Perl XML Columns. Kip's Perl columns are an invaluable source of information if you are interested in combining Perl with XML. Kip's site has all the information required to build powerful tools.



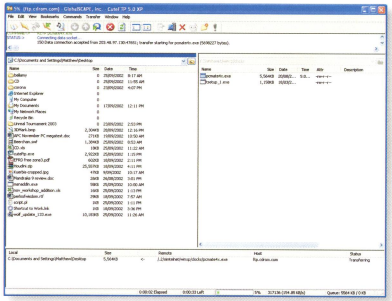
***Passionate Perl**: because of Perl's active community base, passionate Perl programmers are all over the Web.*

www.wdvl.com/Authoring/Languages/Perl/PerlfortheWeb/toc.html
Aaron Weiss' outstanding The Perl You Need to Know article. Contains all the information you need to program Perl for the Web. Includes all types of useful hints, tricks and code examples.

www.webreference.com/programming/perl
Web reference maintains an extensive list of Perl-related Web sites.

www.perl.com
A Perl site run by O'Reilly books. A lot of detailed information regarding Perl and its functions can be found on this site.

Cute idea: *A tool like CuteFTP is invaluable for uploading your scripts and setting permissions.*



Remember that because you searched for a specific query string to execute the program, you will have to enter an else clause just in case the person executing the script messes it up. We have opted for an else clause that simply reports back to the browser that it was inappropriately executed.

```
else {
&header;
print "You got that wrong… Try Again.\n<br>";
}
```

After you've finished with the code, you can save your Perl script as "script.cgi" and prepare to upload and publish it on your Web site.

TIME TO UPLOAD

Upload your script to your Web server using an FTP program. Our favourites are CuteFTP for Windows (**www.cuteftp.com**), and gFTP (**www.gftp.org**) for Linux. Make sure your transfer mode is set to ASCII and place the script in the directory that you'd like to execute it from.

Many ISPs will require that you place the scripts in a certain directory, as they tend to be picky about letting their users execute scripts willy-nilly on their servers. Once again, it's best to check with your ISP.

The next thing to check is that you have the correct file permissions set on the file. Make sure the file is set to Read/Write/Execute for the Owner, Read/Execute for the Group, and Read/Execute for Everyone else. To set the file permissions for your script, enter the following command in a shell: chmod 755. You can also change the file permissions remotely using FTP if you are accessing your Web server from a Windows box.

Your script is now installed in its new home, with the correct file permissions and path references inside the code itself. You can call the script from within a browser, and it will be executed. Our particular script didn't do much useful in this instance, but Perl can be used to achieve virtually anything. You're only bound by your creativity.

Where Perl fits in

There are lots of client-side scripting languages that can be used to access databases, manipulate form data, or perform any number of back-end tasks. Here are the four most popular to take a look at if Perl doesn't interest you.

ACTIVE SERVER PAGES
http://msdn.microsoft.com/library/en-us/iisref/html/psdk/asp/iiwawelc.asp

ASP was initially introduced by Microsoft with the release of IIS (Internet Information Server). It's designed for programming Web applications and currently only runs on the Windows platform. With the release of Visual Studio .NET, Microsoft has released ASP.NET, which contains updates for the .NET platform.

COLD FUSION
www.allaire.com

Cold Fusion is a basic scripting language that bears a passing resemblance to HTML. Because of this similarity, it tends to be easy to learn for Web developers that are already well-versed in HTML. The biggest problem with Cold Fusion is that it's not free: it's a proprietary technology owned by Allaire.

PHP 4
www.php.net

PHP is a relatively new language and was touted as the be-all and end-all of scripting languages. It's widely available for Unix, and is free. PHP's biggest strength is in database access and manipulation, and it is often used on Web sites that rely heavily on large, complex databases.

PYTHON
www.python.org

Python is one of the most extensible scripting languages available. It's object-oriented and is often compared with Perl or Java. It shares the same concepts as many higher-end programming languages, making use of modules, classes and interfaces to system calls. Windows, DOS, OS/2, Macintosh and Unix versions exist.

Spoil yourself with colours

editors choice 1

10/10
AWARD WINNER

AusPCWorld
10/10 POINTS, Editor Choice Award.

PC USER
Good Quality, Excellent Cases.



COLOUR CASE - Champion Series (Wireless Keyboard and Mouse, Display panel Optional)

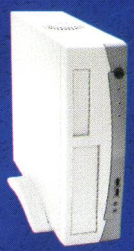
Server Quality in Mini Tower Cases - Review on Casesjunkies.com.au.
There is a numerous fearure on the Galaxy II that shows the detail and functionality expected in a Server Quality case.



Galaxy II
Air Filter / Front Access USB/Audio

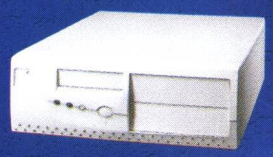


KA-68G7
Front Access USB



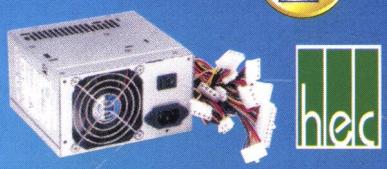
KA-V30
Micro ATX
Front Access USB/Audio

Compact desktop case



KA-731 P4CD
Micro ATX

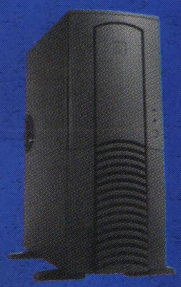
CHIP MAGAZINE Rating 1



Award Winning Power Supply
(Germany), Available on 250/300/400/460W



29RU **42RU**
Rack Cabinet



Jet Server / Black



SR-103
P4 Dual Cpu
Solution

Server Cases - Jet Server, Cube SR103 Cube Server available with Single or Redundant P/S
Redundant P/S-2 x 300W Mini, 2 x 400W, 2 x 460W P/S - Fully Certified
IPC Rackmount Cases, 1RU, 2RU, 4RU, 5RU, 8RU
Rackmount Cabinet, 29RU, 38RU, 42RU

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website: www. fortunetec.com.au **email: sales@fortunetec.com.au**

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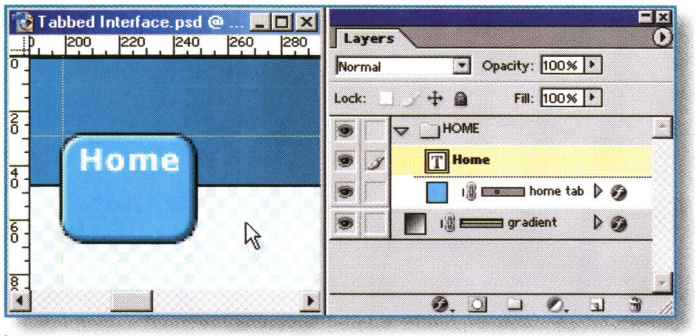
fortunetec AD11

Web interfacing with **Photoshop**

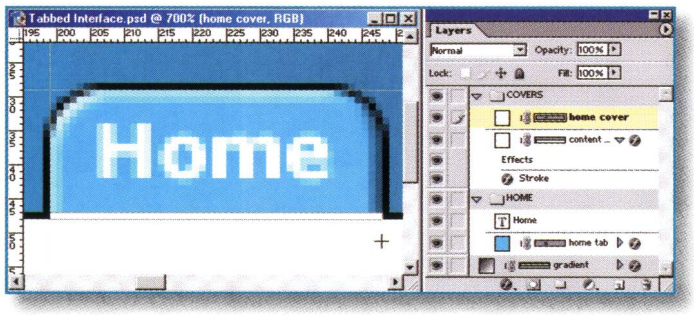


***Trevor Morris* shows how you can create user-friendly Web interfaces with the best WYSIWYG editor of them all — Photoshop.**

Some of the best Web sites use one of the most basic navigation devices: tabs. This first part of a two-part workshop will show you how to exploit the power of Photoshop's shapes and styles to create a completely extensible tabbed interface.



***Wrap up:** the first tab is complete, but you'll need to cover up the bottom.*



***Undercover:** a single-pixel cover is required to hide the black stroke for each tab's click state.*

LAYING THE FOUNDATION

Create a new document named "Tabbed Interface" that is 640 x 86 pixels (W x H). Since the image is destined for the Web, leave the resolution at 72 pixels per inch and set the Mode to RGB Color; choose Transparent for the Contents.

Begin by creating the gradient background for the tabs. Set the foreground colour to R45, G158, B240 (#2D9EF0), and set the background colour to R6, G24, B38 (#061826). Select the Rectangular Shape tool (U). To ensure that all shape layers have crisp edges (that is, no anti-aliasing), turn on Snap to Pixels in the Geometry Options drop-down (the downward-facing arrow to the right of the Custom Shape tool button).

Draw a rectangle from the top left corner that is 48 pixels high and the full width of the canvas. Use the Info palette (F8) to see the dimensions of objects while you draw them. From the menus, choose Layer, Change Layer Content, Gradient. Choose Foreground to Background from the Gradient drop-down and enter 0° for the Angle.

Choose Stroke from the Effects button at the bottom of the layers palette (the one that looks like a stylised "f"). In the resulting dialog box, set the Size to 1px, the Position to Inside and the Color to black (R0, G0, B0).

Press Ctrl+R (View, Rulers) to turn on the canvas rulers and drag two guides onto the canvas: a horizontal guide at 199 pixels and a vertical one at 29 pixels. Also, ensure that View, Snap is turned on (Ctrl+Shift+;).

To keep things organised, create an individual layer set for each tab. For the first tab, add a new layer set named "HOME" (Alt-click on the button that resembles a folder, at the bottom of the layers palette). Set the foreground colour to R45, G160, B243 (#2DA0F3).

Select the Rounded Rectangle Shape tool (U) and, in the Options palette, set the Corner Radius to 8px. Beginning at the intersection of the guides you added, draw a rounded rectangle that is approximately 50 x 40 pixels.

Choose Stroke from the Effects button menu. Enter 1px for the Size and choose black (R0, G0, B0) for the Color. Before closing the Layer Style dialog box, select the Bevel and Emboss effect from the list of effects on the left (click on the name, not just the checkmark).

Establish the following values (leave all other values set to their defaults): Depth: 170%, Size: 2px, uncheck Use Global Light, Angle: 135° and Shadow Opacity: 50%.

Place another horizontal guide at 42 pixels to use for aligning the tab labels. To precisely place guides, zoom in and hold the Shift key while dragging to force the guides to snap to the ruler increments.

Press D to reset the colours to the defaults and then press X to exchange the foreground and background colours — this is the fastest way to set the foreground colour to white. Select the Type tool (T) and use the Character palette (View, Character) to establish your preferred font for the labels (I used 11pt Verdana, Bold with a tracking of 50pt and anti-aliasing set to Crisp).

Click to place the type cursor on the new guide, over the tab. It doesn't matter how precise the initial placement is, you can reposition the layer after. Type "Home" and then press the Enter key on the keypad to commit the text (or Ctrl+Enter on the keyboard — or click the checkmark in Options).

COVER LAYER

Add another layer set named COVERS. Select the Rectangular Shape tool (not the Rounded Rectangle tool) and draw a rectangle that fills the remaining transparent region of the canvas. Add a black stroke effect set to Outside.

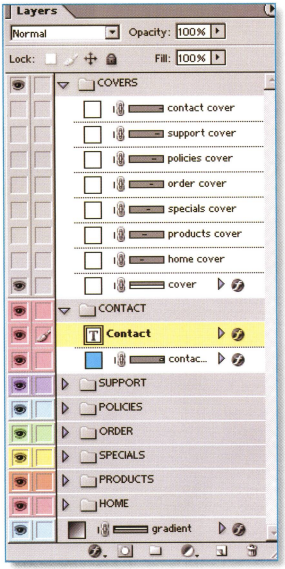


Crowd-pleaser: *a preview of the completed interface.*

This new cover layer works well for the normal states: however, you'll need to hide the black stroke for each tab's click state — this will become more apparent when the time comes to animate the interface. On a separate layer within the COVERS set, create a white, single-pixel horizontal line that is the same width as the interior base of the tab (i.e., the width of the tab not including its stroke).

Use any tool you like to create the new cover. I used the Rectangular Shape tool. If the new layer has any effects applied to it, delete them and then turn the layer off.

If you're up for a challenge you can use animated channels in conjunction with the Layer Mask Hides Effects option (under Advanced Blending options in the Layer Style dialog box) instead of creating the extra cover layer for each tab.



All clear: *the interface is now ready for export to ImageReady.*

REUSE AND RECYCLE

Duplicate the HOME set by dragging it onto the New Set button at the bottom of the Layers palette (or right-click on the set and choose Duplicate Layer Set). Name the new set "PRODUCTS" (or whatever you wish) and then use the Move tool (V) to position it to the right of the Home tab — add the Shift key to constrain movement to the horizontal axis. Leave about a one-pixel gap between the tabs.

In the Layers palette, double-click on the type layer thumbnail associated with the new set and change the label to "Products". Hold down the Ctrl key (or use the Move tool) to position the text.

If the label is too large for the new tab, use the Direct Selection tool (A) to select the right-most four points of the tab and (Shift-) drag them to the right. Do not use Edit, Free Transform as this will result in elongated corners.

If, while trying to select the four points, you keep inadvertently selecting other layers, simply turn them off (that is, toggle their visibility via the eyeball icons).

One more thing: press Ctrl+Shift+H (View, Show, Target Path) to toggle the visibility of paths/shapes.

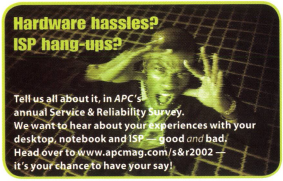
Repeat the above procedure to create as many tabs as you want in your interface. Remember to keep all the tab sets below the COVERS set.

Also, don't forget to create the single-pixel cover layers for each tab — name them to avoid confusion.

WRAPPING UP

Complete the interface by adding your own personal logo or watermark in the upper left corner. You may also want to dress up the gradient or change the colours.

Next month, you'll use ImageReady to slice the interface, create click states for each tab and then optimise the interface for the Web.



Skinning your Pocket PC

Brand your PDA with your own style using PPC2002's in-built skinning features and some excellent third party apps. *Adam Yap* explains.

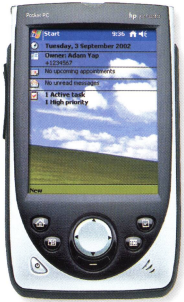
Sick of the standard blue Today screen and flat Start bar? How about a complete Windows XP makeover, or even a cool-looking Mac OS X skin? With a bit of time, and this month's cover CD, you can breathe new life into your Pocket PC.

TODAY, YOUR WAY

Pocket PC 2002 supports skinning out of the box with the native Today app. This type of skinning is quick and easy; all you need to get started is a theme file, which comes in the .TSK format. You can find these all over the Web at sites like Microsoft's own skin page (**www.microsoft.com/mobile/pocketpc/downloads/themes.asp**) or at specialised sites like Pocket Themes (**www.pocketthemes.com**).

Themes don't usually come with installer programs and have to be installed manually into either the Windows or My Documents folder on the Pocket PC itself. To browse the Pocket PC file system, click the Explore button on ActiveSync.

Once installed, the themes show up in the Today settings program. Just select the new theme and tap OK. The new theme overrides the colours of the Start and bottom menu bars, the colour of the text in the Today screen, and the Today screen background.



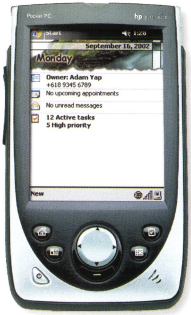
Ready to go: *Pocket PC 2002 supports skinning out of the box.*

Creating your own custom theme is almost as easy. Start by using Microsoft's own free Theme Generator (**www.microsoft.com/mobile/pocketpc/downloads/themegenerator.asp**). This creates themes with custom Today and Start Menu background images. It's reasonably advanced, allowing you to change font colours and to adjust the transparency of the background images so that text shows up easily against them.

To build more advanced themes you'll need a shareware package like ThemeMakerPT (US$15 from Pocket Themes) which will let you customise the colours of the top and bottom status bars, as well as the colours of the pop-up information boxes like the volume window.

After you've put in a custom theme, try out Today's The Day (Freeware from StellarMetrics, **www.stellarmetrics.com**), a Today screen plug-in which lets you set a skinnable bar at the top of the Today screen. It changes every day, so you can have a different graphic for each day of the week.

Lots of free skins are available at **www.stellarmetrics.com/Software/ttd_themes.htm**, which also has instructions for making your own skins. They're just specially sized JPEGs so you can create them in any good photo editor or paint program.



Today's The Day: *Gives you a different graphic for every day of the week.*

To really customise your Today screen, there's no better way than with Snoopsoft's excellent Dashboard program (US$13 from Snoopsoft, **www.snoopsoft.com**). This replacement Today screen not only lets you completely tailor how the Today screen looks (complete with icons, background, tabs, text etc.,) but it radically improves how the Today screen works.

The biggest difference is how Dashboard packs in much more information than the standard Today screen. You can choose to see more than one day of appointments on screen, and view your tasks instead of just being told how many there are. To top it off, Dashboard has five screens instead of just one. You can choose which one you're viewing by clicking on icons or tabs.

The other four screens are a dedicated mail screen, task screen, launcher and the MyDash module. The Launcher screen is basically a summary of the Programs screen you reach from the Start Bar, although you can also configure it to show any shortcuts you want. MyDash is the home for special Dashboard plug-ins, letting you view a quote of the day or even a monthly agenda view.

One of Dashboard's best additions to the standard Today screen is the mini-launcher. This lets you integrate the Launcher screen with the standard Today screen so you can view all the day's appointments and tasks as well as a strip at the top of your screen for access to your 12 favourite apps.

It's a simple idea but it makes a huge difference to how useful your Today screen is. Configuring both the Launcher

The Pocket PC XP makeover

Windows XP gave your PC a brand new look but Pocket PC missed out on the new styling of Microsoft's flagship OS. To get the XP look, we installed the iPAQ Dashboard (available from **www.compaq.com/support/files/handheldiPAQ/us/download/13513.html**) and Pelmar Wisbar onto an upgraded iPAQ 3630. Installation is straightforward, just run the Windows installers for both applications and follow the prompts.

Dashboard has to be activated from the Settings, Personal, Today setup screen under "Items". Remember to tick the box next to Dashboard and to untick everything else. Wisbar also has to be started separately from the Programs screen.

THE SKIN

To find the perfect XP skin, we looked at **Wincustomize.com**, which has one of the biggest collections of Dashboard skins available online. XPMA Gray is just one of over 70 skins available and comes with a matching Theme and Wisbar skin.

All the skin and theme files are mixed up together in the ZIP file, but they all need to be installed in different places. The Dashboard files need to be placed in the \Program Files\Compaq\Dashboard\Skins\ directory by default and the remaining files should be installed somewhere within My Documents. Finally the Windows Theme file which has a TSK extension should be placed in My Documents or in Windows.

It's not always clear which files are part of the Dashboard skin and which belong to Wisbar, but since the skin files are relatively small, it's possible to install all the files to all the directories or to configure Dashboard to use the My Documents directory to store skins.

CONFIGURATION

To configure Dashboard, go to the Today screen and tap on the Options button. Under the Skins tab, choose XPMA grey.dsh. If this skin isn't listed, check that all the files are installed in the right location and tap the Reload Skins button.

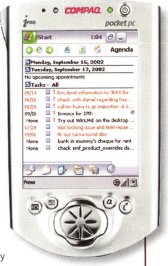
Once the Today screen is done, start up Pelmar Wisbar and configure it by tapping on the time and selecting WIS Bar Options. In Options (1), make sure that the Today Icon and Volume Icon are both selected.

Choose a Start Button and Background image in Images by deselecting Standard Windows Logo and Show Gradient. You can then browse to the appropriate BMP files, which in this case are XPMA_grey_start.bmp and XPMA_grey_wisbar.bmp.

After configuring the Images, change the Buttons graphics by associating the correct BMP file to the Today, Volume, OK and Close buttons. The filenames are usually self-explanatory, such as XPMA_grey_today.bmp.

If the fonts aren't visible on the Start bar, change the colour of the fonts in Options (1); in this case, black works well.

Finally, choose the Xpma grey theme from the Today setting screen in order to customise the Start bar dialog.



Perfect skin: *A Compaq iPAQ after a Windows XP makeover.*

and the mini-launcher is done through shortcuts. Place shortcuts to your applications into the launcher and mini-launcher directories inside the /Program Files/Dashboard directory and they'll appear in the appropriate screen.

Dashboard comes pre-installed with a few skins but you'll definitely want to go further than the default set. You can download skins from **WinCustomize.com**, which has the largest repository of skins, but also try the Dashboard collections at **PixelMayhem.com** and **Ojster.com**.

If you feel like trying your own hand at making Dashboard skins, give Skin Me (Freeware from Desertware, **www.desertware.com**) a go. It has a pretty neat interface and is way easier than creating the skins from scratch, which requires a text editor and a lot of individual BMP files.

If you own a PPC2002 iPAQ, or if you've upgraded your original iPAQ, you already have Compaq's re-branded version of Dashboard (the iPAQ Dashboard). This provides most of Dashboard's functionality, but the MyDash tab is replaced with a Contacts plug-in. Download the latest version of iPAQ Dashboard from Compaq at **www.compaq.com/support/files/handheldiPAQ/us/download/13513.html**.

SKINNING THE START BAR

With the Start bar it's time to look past simple themes. Wisbar (Freeware from Pelmar, **www.pelmarinc.com**) pulls no punches in letting you customise the Start bar. The latest version not only skins the Start bar background, volume, start, close and ok buttons; but also provides a new Today screen button and let's you add the date, time, battery or a memory bar to the Start bar.

Best of all, because the Start bar is visible almost all the time, by skinning it you effectively skin your entire Pocket PC — more effective than just prettying up the Today screen.

Wisbar is also a master application manager, letting you switch between and close applications that are already open. Because Wisbar is always available at the top of the screen, it's the fastest, most convenient way of switching between apps and freeing up memory. To access Wisbar's application manager, tap on the date or time on the Start bar when Wisbar is loaded.

Skins for Wisbar are simple: each Wisbar component, like the Start bar background or a button, is loaded up from a standard BMP file. Create these BMP files with your favourite image editor (try PaintShop Pro from JASC) in the correct size and just place them somewhere in My Documents on your PPC. In the Wisbar config screen, you can browse to the right directory and assign the graphic to a Wisbar element.

There are pre-made Wisbar skins all over the Web, almost always packaged with a matching Dashboard skin; you'll find them at the same places you find Dashboard skins.



PC

Mafia

When Grand Theft Auto 3 (GTA3) was creating a huge stir in the console world, PC owners quite rightly felt a little left out in the cold. It was only well after the furore and fanaticism subsided that the title touched down onto hard drives worldwide. By then it was still a great game, but it felt like something was missing.

Illusion Software — distributed in Australia by Take 2 Interactive (who also released GTA3 here) — has come up with an answer to make all PC owners proud. Hard as it is to believe, Mafia betters almost everything GTA3 turned its hand to. It's taken a long time — and three CDs — but it has been done.

Mafia is set in a fictitious Prohibition-era American city called Lost Heaven. You play the part of Tommy Angelo, and make the odyssey from lowly cab driver to powerful mob figure. Things are quite slow-moving in the beginning — that "cab driver" part is taken literally. It's perfectly acceptable in this instance. The enjoyment of initially exploring the city at a leisurely pace offsets later stages where the tone gets more urgent: get from A to B to whack person C.

If you have ever seen or played GTA3 you'll know what to expect. Third person gangster action in a living, breathing, dynamic city. Undertake delivery tasks, snuff out rivals, act as a bodyguard and run the gauntlet in over 60 period vehicles.

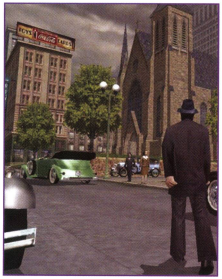
The fun isn't over after the (lengthy) campaign mode is finished either. Free Ride and Free Ride Extreme modes allow players to roll through Lost Heaven at their leisure, or undertake special missions.

The rolling aspect is important. In Mafia, a lot of time is spent in-vehicle, and this is where a lot of attention has been paid to getting the formula right. Cars sustain damage (and respond accordingly) and small details like shooting the tyres can have dramatic results. There are around 12 miles of city to come to grips with, and the level of detail in the city environs also shades GTA3 quite significantly.

And when you get out of the car, you'll be packing some serious heat. Knives, baseball bats, and firearms all the way through to fully automatic Tommy guns are there for your judicious use.

Control options, configuration flexibility and scalability of PC hardware have been addressed satisfactorily by the developers. Wheels, joysticks, keyboard and mouse are all supported, and the level of visual effects can be adjusted to cater for slower PCs. Those with beefier computers will want to leave as much detail running as possible.

Mafia is a joy to watch running at a decent frame rate and resolution. A lot of time has been taken reproducing the look and style of the era to stunning effect. Sound is no laggard either, with tonnes of vintage music and chunky sound effects thrown into the mix.



Goodfellas: *Mafia's edge is in its characterisation.*

Mafia is not a mere GTA3 clone, it expands the fledgling third person "living city" crime sub-genre more than those before it. It's a shame that multiplayer has not made its way into this game. The ability to wage war on rival gangs online or on LAN would have elevated this into the pantheon of all-time greats. For many it may still be. This aside, Mafia is gold.

Online *www.mafia-game.com*
Price *$89.95*

The Sum of All Fears

From the movie (and book) of the same name comes Red Storm Entertainment's latest excuse to throw out another iteration of its tactical shooter series. And it's no slouch either. Take your team of merry counter-terror men into a series of missions aimed at stopping the evil menace of terrorism.

If you've never tried the Tom Clancy-licensed series before, you're in for a treat. This is "serious" tactical play. No unlimited ammo or health packs here — if you cop a bullet or two, you're history. Stealth, accuracy and a good command of the team dynamic are all essential.

Gone are the days when you could send your team bumbling around while you set about removing the enemy menace on your lonesome. It's a real team player's game, both in multiplayer and single player modes.

If you have tried Rogue Spear or one of the other preceding titles, or like your FPSes to run and gun, you may be best served elsewhere. For everyone else, however, the low price, topical subject material, and the movie tie-in — however tenuous — make this a great pick up.

Online *www.redstorm.com*
Price *$49.95*



Affleck defect: *the title is about the only thing the game and film share.*

Emperor: Rise of the Middle Kingdom

Ever wondered if the Sim City formula could be extended? Impressions Games certainly think so, having worked on a series of similar titles spread across different locales.

Like predecessors Caesar II and Zeus: Master of Olympus, Emperor: Rise of the Middle Kingdom is all about domain building in a style very reminiscent of Sim City. You "zone" land, build utility structures, and wait for the masses to come flocking to your fiefdom.

Don't expect lavish 3D or cutting edge visuals, this is utilitarian 2D stuff, but to its credit, there's a lot of meat on this bare bones playing model.

Set in China, this is not the type of game that lends itself to casual play. When you sit down, expect to be drawn quickly into a world where such banal concerns as roadworks and agriculture assume as much importance as warring factions and city expansion.

Veterans of Impressions titles after a new solo experience may be disappointed by the limited progress the series has made. But newcomers willing to look past the so-so visuals are bound to be impressed by the amount of things to do — including an ambitious multiplayer mode.

Online *http://emperor.sierra.com*
Price *$89.95*



Eastenders: *the Oriental setting is a breath of fresh air.*

The Thing

Following on from John Carpenter's classic film of the same name, The Thing is intended to be a grim exploration of fear, trust and mutated alien beasties. In reality it's a grim exploration of questionable scripting, saved somewhat by decent graphical output. The premise? Gather a band of paranoid scientists, attain their trust, avoid the ones who get infested, and eliminate the title subject.

The Thing certainly looks the goods — most of the time. It uses a third person perspective which makes weapon aiming problematic, but luckily the models are well-defined and the environments are realistic enough to pass muster.

Sadly, the mutant victims of The Thing aren't the most imaginative of designs, and won't cause too many chills after a couple of viewings.

The much vaunted fear/trust aspect of the game is underwhelming. Attempting to figure out who is "turning" on you seems almost futile — almost everybody does sooner or later. Factor in an erratic control schema and puzzles meant to obstruct rather than forward the experience, and you might be finding the all-too brief time required to complete the game a blessing in disguise.

Online *www.thethinggame.com*
Price *$89.95*



Underdone: *barbequed or not, The Thing is light fare.*

Battlefield 1942

PC

WW2-themed first person shooters have now officially reached their zenith. This is no add-on of an existing game, no Quake game with soldier-like models. Make no mistake, this is the *Saving Private Ryan* of first person shooters.

You don't just get dumped with the infantry in Battlefield 1942 — you can also use tanks, destroyers, submarines, planes, jeeps and more to win the war.

Four theatres of conflict feature in the game: North Africa; Western and Eastern Europe; and the Pacific. The environments reflect the locations, but BF1942 concentrates on accurately reproducing the actual battles more than the locales.

Everything in this game shouts quality. The visuals will make even the beefiest PC cry uncle, the weapons modelling is exacting, and the scope is as wide as the war was itself.

BF1942 includes both single player campaigns and four multiplayer modes. Single player mode is deep enough to satisfy casual players, while the hard-core will work their way through in no time. It largely serves as a taster for BF1942's prime strength — multiplayer.

Team deathmatch, co-operative and capture the flag modes are all by-the-book material. Then there is Conquest, a mode that focuses on controlling key points of the map. The beauty of multiplayer in BF1942 is its flexibility.

The amount of vehicles on offer means that the flyboys and flygirls will have as much fun as the tank jockeys, sailors and foot soldiers. You really do have to strongly rely on your teammates, as most scenarios work best with more than eight players per side.

Expect some frustration if playing online with strangers, as co-ordinated efforts tend to go out the window. Playing with friends in a LAN environment is however a near-transcendent multiplayer experience. This is one possible future path for online gaming, and while you really need a broadband connection at least, it's a very attractive one.



***Not to be missed**: this is one of the best games this year.*

With compelling single and multiplayer gameplay, and an engine that will not be quickly outstripped by your hardware, BF1942 looks set to be the next big thing in online FPS. Make sure you don't miss the boat, this is one of the best titles of the year.

Online *www.battlefield1942.com*
Price *$89.95*

PS2

V8 Supercars Race Driver

Racing games may proliferate, but bringing a new wrinkle to the formula is Codemasters. Its new offering extends the game's lifetime by offering a RPG-style career mode, where you guide your feisty protagonist, Ryan McKane, both off and on the track to V8 glory.

The acting is a bit hammy, but it's all in good fun. Aussie and New Zealand tracks are included, and the game is endorsed by AVESCO Australia. With a very smooth racing model and accurate car damage and physics, this game is definitely in the same class as Gran Turismo in the replayability stakes.

Online *www.codemasters.com/v8racedriver*
Price *$109.95*



***Local hero:** down under gets more than lip service.*

XBOX/PS2/GAMECUBE

Kelly Slater's Pro Surfer

Surfing legend Kelly Slater has finally arrived on console, and it has been well worth the wait. The game's focus favours the "soul surfer" over the predictable competition format, and is much stronger for it.

The wave model and graphics are peerless. Each wave is randomly generated, but complies with the location's characteristics. The surfing moves strongly reflect reality — only a handful of tricks stretch the bounds of credibility. Pro Surfer may hold limited appeal to some, but those with an interest in the lifestyle or sport will find this deeply satisfying fare.

Online *www.activisiono2.com/slater*
Price *$99.95*



***Gnarly:** Kelly pumps the blue juice.*

PS2

Project Zero

Project Zero's premise — exploring a haunted house — is hardly original. Its expression is, however. There aren't any superpowers or mega-weapons. When confronted by ghosts, your character uses a camera to "capture" them. The more you capture, the more powerful the camera becomes.

The pacing, subtlety and suspense of the game please mature players. Clever lighting and effective use of force feedback — the controller pulses in-sync with the character's heartbeat during fraught situations — adds to the "something is stalking me" atmosphere.

Online *www.fatalframe.com*
Price *$99.95*



***Ghostbusters:** say cheese.*

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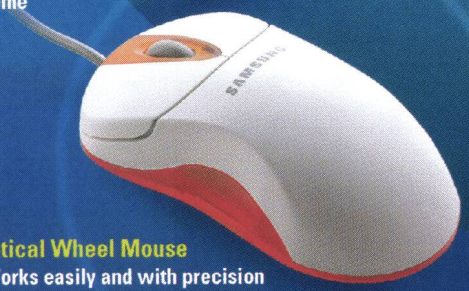
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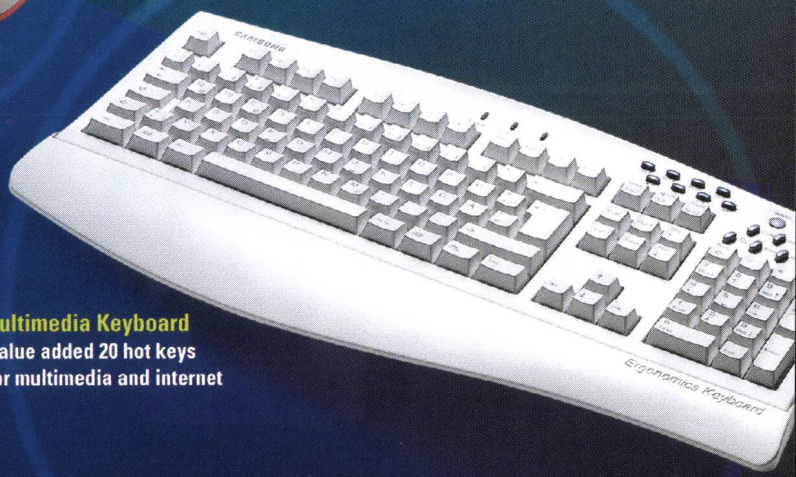
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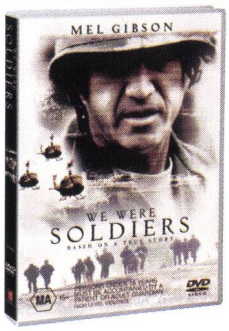
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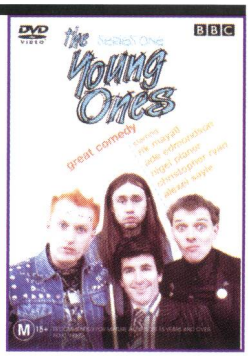
We Were Soldiers



Hollywood asks Mel Gibson to show that history isn't always written by the victor. Deleted scenes and a "making-of" featurette are on offer, but this can't compete with the likes of *Platoon* for depth, nor *Saving Private Ryan* for visual and audio excellence.

Price *$34.95*

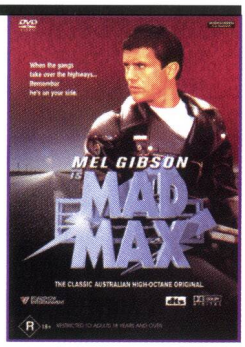
The Young Ones Series One



If you just can't get enough of Rick's "cwap" poetry, Vyvyan's SPG hamster, Neil's pathetic suicide attempts and Mike's playboy antics, this is for you. Including the first six episodes, *Series One* is a must-have for fans of Scumbag College's finest.

Price *$34.95*

Mad Max

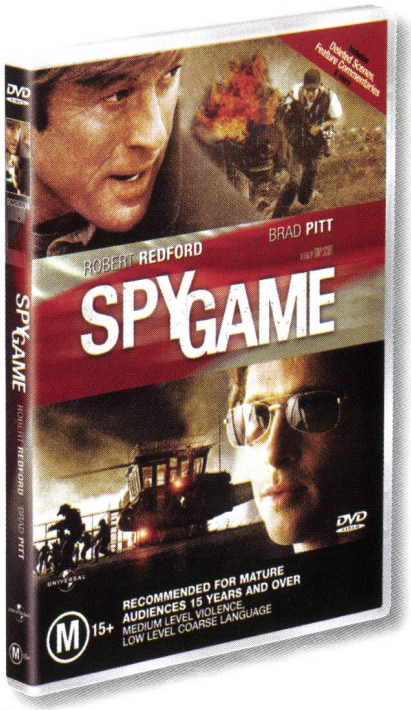


Post-apocalyptic Australia's outback highways are ruled by violent gangs and, after the murder of his partner and family, cop Max Rockatansky is out for revenge. Special features include the *To The Max* featurette with cast and crew interviews, Max facts and theatrical trailers.

Price *$34.95*

Spy Game

Hearthrobs past and present headline in this high-octane tale of international espionage.



Game on*: as CIA spies, Pitt and Redford are fighting both sides in this international thriller.*

Spy Game is yet another Hollywood "last day" story; this time in the form of a tension-packed espionage drama.

The plot joins Nathan Muir (Robert Redford) on his final day before retirement at the CIA. His former protégé, Tom Bishop (Brad Pitt) is arrested while on a rogue mission in China and he is sentenced to execution — at the same time as the US and China are trying to negotiate a valuable trade agreement.

The CIA big-wigs would rather see the trade deal done than risk bi-lateral relations by helping Bishop, who has less than 24 hours to live.

Muir takes it upon himself to help Bishop — all the time concealing his actions from the CIA bosses — who want to interview him about his relationship with Bishop.

The plot is intense and twisting, with Pitt and Redford both turning in strong performances. Unfortunately their characters are not developed enough to draw in the viewer.

AUDIO

The production of this DVD is top-notch. The best example of the audio track's quality comes in a scene where a building is bombed in Beirut — the tone from the explosion is rich, gritty and loaded with bass. The Dolby 5.1 and DTS tracks provide outstanding depth as debris can be heard whooshing past your ears.

VIDEO

The video is presented in 2.35:1 anamorphic widescreen. The extra detail afforded in widescreen mode is appreciated, particularly in expansive street scenes in Beirut and Berlin where Muir and Bishop blend into their surroundings. The tones are spot-on, and no obvious compression artefacts are left over from the DVD conversion.

EXTRAS

An extensive list of extras has been bundled: some interesting, others not. The standard director's commentary and "making of" clips are included, along with a number of extra scenes and a storyboard featurette that details the design process for each scene.

The "White Rabbit" feature of *The Matrix* DVD has been copied with the *Spy Game* release — when you are watching the feature, an icon appears on screen during certain scenes. If you click on the icon, you are provided with extra detail on the scene. This is also the first release from Universal Pictures that makes extra DVD content available online, so Internet-enabled DVD owners will be able to access bonus features.

There are also a number of out-takes included, with the director's commentary running over a series of scenes that wound up on the cutting room floor. It's a shame, because some of these scenes provided much-needed character development and plot nuances.

Price *$34.95*



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Maximum Apache Security

Statistics indicate Apache is the most common Web server, with over 60% of Web sites using it. It makes sense then that Apache administrators and developers would require at least a reasonable knowledge of how to build and maintain secure Web servers and applications.

The premise of *Maximum Apache Security* is clear — the majority of publicised attacks on Web sites are a direct result of poor Web site or application security.

So yes, it's an important topic. After all, Apache already prevents throttling, spoofing and other mischievous activities. However, problems often arise with custom database-driven applications, Common Gateway Interface (CGI) programs and the server — in other words, computer-based issues.

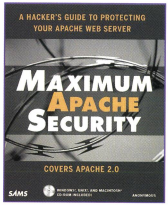
These are potential areas that system administrators — perhaps new to server OSes such as Linux or not from a programming background — may need to brush up on.

The book's cover provides no hint to the sheer wealth of practical and detailed information inside. Beginning with the basics of physical computer security, it moves on to advanced configuration topics and commercial add-on software.

The author is to be commended for the comprehensive detail of information provided, together with a good practical aspect. Examples cover not just Linux and UNIX variants, but also Windows and Macintosh environments. The depth of the examples indicates that the author does indeed have a wealth of experience.

Maximum Apache Security is a necessary desktop reference for any Apache administrator and programmer.

David Williams



Publisher *Sams*
Price *$84.95*
ISBN *067232380X*

How To Do Everything With Windows XP

The aptly titled *How To Do Everything With Windows XP* is a solid beginner's guide to varying functionality in Microsoft's latest OS.

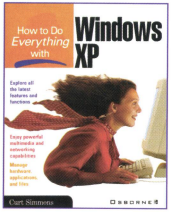
The book covers the new desktop, control panel, hardware, home networking, maintenance and troubleshooting. Also, there are comprehensive chapters on Windows Media Player 8, Movie Maker, Internet Explorer 6, Outlook and all the new bundled applications in XP.

How To Do Everything With Windows XP is surprisingly in-depth, with almost 500 pages that cover topics from the basics of desktop use to advanced topics such as Disk Mirroring.

Other good points are the troubleshooting chapter and lists of shortcut keys — very useful. On the negative side, it lacks some coverage of the most popular utilities that don't come with XP — Acrobat Reader or TweakUI for instance — which would have been useful.

Furthermore, for rookie computer users the book isn't structured clearly enough. It explains the functions of the Recycle Bin and Control Panel in depth before even examining what the Start Menu does.

Nevertheless, the book provides XP users with a clear path for taking advantage of their new operating system and assuming control of their computer experience.



Publisher *McGraw Hill*
Price *$44.95*
ISBN *007219300X*

Disappearing Cryptography Information Hiding

It may be the concealment of business secrets, maintenance of copyright, or protection from "big brother" governments — cryptography plays an important role in modern society.

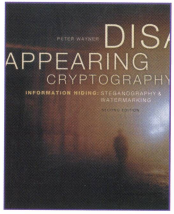
Covering a huge array of topics — from encryption and compression through to conducting secret broadcasts — *Disappearing Cryptography* gives an in-depth discussion on each procedure.

Two topics, however, are covered with particular emphasis — steganography and watermarking. Both these relatively unheralded techniques describe methods of hiding data in other media — such as pictures for example — by replacing the least significant bits of data with information such as text. It's astounding to see a series of undetectably altered pictures knowing that each contains tens of thousands of bytes of text.

Despite providing deeply technical discussions on all the topics, the author ensures the text remains accessible to all readers by providing basic overviews and summaries at the start of each section.

For those wanting to implement the code themselves, Java scripts for most of the algorithms discussed are also included in the appendices.

Alan Crawford



Publisher *Morgan Kaufmann Publishers*
Price *$113.85*
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IN THE DECEMBER ISSUE OF apc

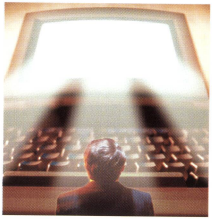
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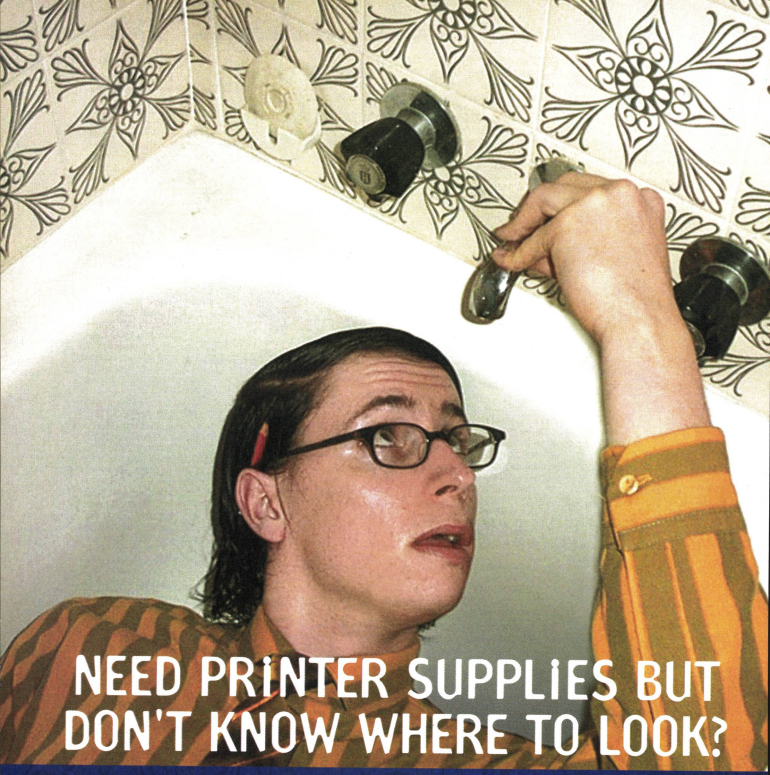
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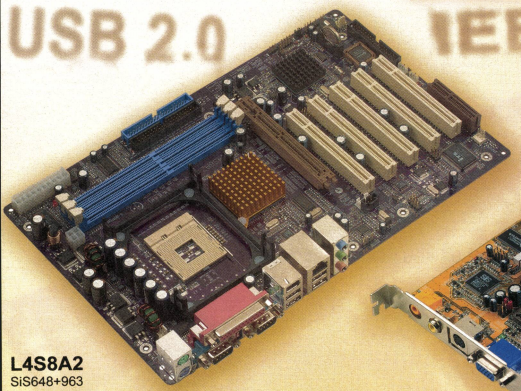
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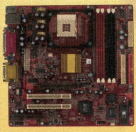
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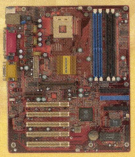


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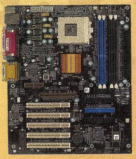
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d2 AIT TAPE DRIVES

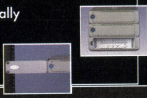
USB2.0 & FireWire interface:
AIT-1 (35GB uncompressed)

Ultra160:
AIT-1 (35GB), AIT-2 (50GB), and AIT-3 (100GB)



FEATURES

- **Dimensions HD:** 16.3x17.3x4.4cm, **Dimensions AIT/CDR/DVDR:** 26.8x17.3x4.4cm.
- **The construction is extruded Aluminum and Zamac alloy,** robust and lightweight materials as used in Formula 1.
- **Low noise for sensible users,** thanks to drive cooling through convection.
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A4CF	A4 Clear Film 100mu	50	$ 39.00	0.78
A3CF	A3 Clear Film 100mu	50	$ 71.00	1.42
A4FGP	A4 Full Gloss Photo Paper	50	$ 44.00	0.88
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AC2	Artists Canvas	25	$ 60.00	2.40
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CANON BJC-600/610/620	16	5-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	45	19-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20	9	18-BKL
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HP Desk Jet 300 Series & Olivetti JP's!	8	7-BKL
EPSON Stylus 400/800/850+/1000	8	1-BKL
EPSON Stylus Colour /PRO/XL	12	2-BKL
EPSON Stylus 820/colour II/Is	12	23-BKL
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	12	33A-BKL
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	12	33B-BKL
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CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	3x30	17-CLR
CANON BJC-3000/6000/8000 Series	3x8	47-CLR
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HP Colour Desk Jet 600C/660C/690C Series	3x12	14B-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30A-CLR
HP Desk Jet 710/720/890/900 Series	3x3	30B-CLR
EPSON Stylus Colour /PRO/XL	3x4	16-CLR
EPSON Stylus 820/colour II/Is	3x12	24-CLR
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	3x12	34B-CLR
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	3x6	36A-CLR
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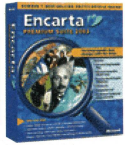
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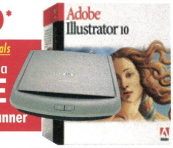
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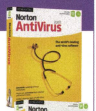
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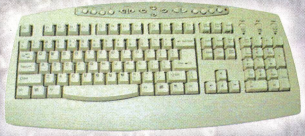
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HomePro 3015

- *Genuine AMD Duron 1300*
- *Gigabyte 7VRXP Motherboard, KT333/3DDR333/266FSB/SPCI/RAID133 /6 USB 2/LAN*
- *256Mb PC-2100 DDR RAM,*
- *40Gb Ultra -100 HDD,*
- *64M GeForce II MX 400*
- *ASUS 48x40x12 CD-RW*
- *MS Windows XP Home*

pc world CODE:CWS2K

$1139 or$11.9/w*

Athlon XP 1700+	$1219
Athlon XP 1800+	$1239
Athlon XP 2000+	$1269
Athlon XP 2100+	$1319
Athlon XP 2200+	$1399

Multimedia 8015

- *Genuine AMD Athlon XP 1700+,*
- *Gigabyte 7VAPP Motherboard, KT400/AGP 8x/Firewire/FSB333/RAID133 /6 USB 2/LAN*
- *256Mb PC-2100 DDR RAM,*
- *40Gb, 7200rpm Ultra -100 HDD*
- *128M GeForce 4 MX 460,*
- *ASUS 48x40x12 CD-ReWriter,*
- *Sony16x DVD ROM,*
- *Windows XP Home*

pc world CODE:CWS2K

$1479 or *$15.36/w**

Athlon XP 1800+	$1499
Athlon XP 2000+	$1529
Athlon XP 2100+	$1579
Athlon XP 2200+	$1659

LuxuryPro 6015

- *Genuine Intel P4-1.8G CPU*
- *ASUS P4S8X Motherboard SiS 645/533FSB/AGP 8x/Firewire/ IRAID133/USB 2/LAN*
- ***512Mb, DDR PC2700,***
- *80Gb 7200 rpm Ultra ATA-100 HDD,*
- *Leadtek 128M GeForce 4, Ti4600*
- *ASUS 48x40x12 Re-Writer*
- *Sony 16x DVD ROM*
- *MS Windows XP Home*

pc world CODE:CWS2K

$2329 or$23.65/w*

Intel P4-2.0G	$2379
Intel P4-2.4G	$2449
Intel P4-2.53G	$2559
Intel P4-2.66G	$2939

StudentPro S1

- *Genuine Intel P4-1.7G CPU*
- *Gigabyte 8SR533 DDR MB, SiS645/3 DDR333/4xPCI/2 USB/ SVGA/LAN/1 Sliver 8870 ATX Case,*
- *512Mb PC-2700 DDR RAM,*
- *40Gb 7200rpm Ultra ATA-100 HDD*
- *44M DDR GeForce 4, 4Zi 8 TV out*
- *40Bx24Wx10BW CD-Re-Writer*
- *Creative PCI 128*
- *Windows XP Home*

pc world CODE:CWS2K

$1299 or *$13.49/w**

Celeron 1.7G	$1159
Intel P4-1.8G	$1339
Intel P4-2G	$1389
Intel P4-2.4G	$1459
Intel P4-2.53G	$1569
Intel P4-2.66G	$1939

GamePro 9015

- *Genuine AMD Athlon XP 1700+,*
- *Asus A7V8X, KT400/AGP8X/Firewire/ 3DDR /4PCI/USB2 /LAN*
- *Sliver 8870 ATX Case,*
- *512Mb PC-3200 DDR RAM,*
- *80Gb 7200 rpm Ultra ATA-100 HDD,*
- *Leadtek128M GeForce 4, Ti 4200,*
- *ASUS 48x40x12 Re-Writer*
- *6-Channel Audio,*
- *Altec Lancing AVS500 Subwoofer,*
- *Sony16x DVD*
- *Windows XP Home*

pc world CODE:CWS2K

$2199 or $22.33/

Athlon XP 1800+	$2219
Athlon XP 2000+	$2249
Athlon XP 2100+	$2299
Athlon XP 2200+	$2389

All Systems come with: *Aopen KF-45 ATX Case, CWS Internet keyboard, Integrated 3D Soundboard, 600W Sub-woofer 3p Speakers, Microsoft Intellimouse Web PS/2, Motorola 56k V.90 Fax/Voice/Date Modem.*

Economic 1015

- *Genuine Intel Celeron 1200*
- *ASUS TUSI-M or GA-7VMML MB,*
- *128Mb PC-133 SDRAM,*
- *20Gb Ultra100 IDE HDD,*
- *1.44Mb, Floppy Drive,*
- *64Mb share On-board video,*
- *52x CD-ROM,*

pc world CODE:CWS2K

$ 679 or *$7.05/w**

Cel-1.3G	$689
Duron 1.3G	$669

Titanium 7015

- *Genuine Intel P4-2.0G*
- *Gigabyte 8IEXP Main Board,*
- *Intel845/533FSB/3 DDR/6PCI/IEEE 1394 4 USB 2.0/ATA133/Raid/Intel Pro Lan*
- *512Mb DDR PC-2100,*
- *80Gb/7200 rpm Ultra -100 HDD,*
- *Leadtek 64M GeForce 4, MX440*
- *Sony 16x DVD ROM,*
- *Creative Live CT5880 Audio,*

pc world CODE:CWS2K

$1579 or *$16.03/w**

Intel P4-2.4G	$1649
Intel P4-2.53G	$1759
Intel P4-2.66G	$2139

StationPro2015

- *Genuine Intel Celeron 1700 CPU*
- *ASUS P4S5GL-VM Motherboard, SiS650/2DDR/3PCI/1AGP/2USB/LAN*
- *256Mb, DDR RAM PC-2100,*
- *40Gb Ultra ATA-100*
- *64Mb share On-board video,*
- *ASUS 48x40x12 Re-Writer*
- *1.44Mb, Floppy Drive,*
- *MS Windows XP Home*

pc world CODE:CWS2K

$1019 or *$10.58/w**

Intel P4-1.7G	$1149
Intel P4-1.8G	$1189
Intel P4-2.0G	$1239
Intel P4-2.4G	$1309
Intel P4-2.53G	$1429
Intel P4-2.66G	$1799

QuamPro 5015

- *Genuine Intel P4-1.7G CPU*
- *Genuine Intel 845GBV MB,*
- *D845/533FSB/6PCI/4 USB 2.0*
- *Intel VGA,*
- *256Mb, DDR RAM PC-2100,*
- *60Gb, 7200rpm Ultra -100 HDD,*
- *ASUS 48x40x12 Re-Writer*
- *MS Windows XP Home*

pc world CODE:CWS2K

$1299 or *$13.49/w**

Celeron 1.7G	$1159
Intel P4-1.8G	$1349
Intel P4-2.0G	$1389
Intel P4-2.4G	$1469
Intel P4-2.53G	$1579
Intel P4-2.66G	$1949

SuperPro Server 5600

(Ideally suited for demanding business applications)

- Intel Xeon processor 2.0GHz
- 512KB Internal L2 Cache/400MHz FS
- Intel SAI2-SE7500CW2 Server Board
- Dual processor capable
- Supports up to 4 GB ECC DDR200/2
- Integrated ATI Rage XL 8MB video
- 2x Integrated Intel PRO/100+ Server
- ATA/100 dual-channel Promise Raid
- Intel ServerControl Management softv
- 512MB DDR RAM With ECC
- 2x Seagate 80GB 7,200 rpm Hard D
- Intel Server Chassis SCS200 Pedest
- CD-ROM, 1.44Mb. Floppy Drive,
- Microsoft Intellimouse

pc wor CODE:CWS2K

$3239

ADD A MONITOR TO SYSTEM

LG:*15" $210,17" $270, 17" Flat $380,* **VIEWSONIC**: *15" $165, 17" $255* **Phillips**: *17" 107E $290 17" 107T Flat $370, 19" FI $740* **Hitachi**: *17" CM615 $290 ,CM621 (F) $360, 19" CM715 $559, CM721(F) $599, 21" CM823 $1550,15" LCD $710, 17" LC $1399* **BENQ**: *15" LCD $700,* **LG**: *15" LCD $750,* **SONY**: *15" LCD $899, 18" LCD $2622, SAMSUNG: 15" LCD $838,*

ASUS S1

Light and versatile, It's everything you need Inside only 1.5 kg!

- *Intel P3-1G, 256 RAM*
- *30G Hard Drive*
- *DVD-ROM,*
- *Intel 839M graphic,*
- *13.3 TFT, 56K/10/100 LAN*
- *USB/1394 Firewire*
- *Optical Mouse,*
- *Deluxe Carry Bay*
- *IBM VIA-VOICE, MICROPHONE*
- *MS Windows XP PRO*

$3179

ASUS L1

The best value for entry level

- *Intel Cel-1.13G, 128 RAM*
- *20G Hard Drive,*
- *DVD ROM*
- *14.1 TFT, 56K/10/100 LAN*
- *TV Out/USB/1394 Firewire*
- *16MB Ai-FLASH USB PEN*
- *Optical Mouse,*
- *Deluxe Carry Bay*
- *IBM VIA-VOICE, MICROPHONE*
- *MS Windows XP HOME*

$2249

ASUS M2

Lightest 14" notebook in the world, without sacrificing the convenience

- *Intel P3-1.2G, 256 RAM*
- *40G Hard Drive, CDRW*
- *14.1 TFT, 56K/10/100 LAN*
- *2x USB Port, 2 IrDA ONLY*
- *Intel 830M VGA, 1394 PORT*
- *IBM Via-Voice, MICROPHONE*
- *Optical Mouse,*
- *Deluxe Carry Bay*
- *MS Windows XP Pro*

$3899

ASUS L2

Complete Solution, All in one

- *Intel P4-1.4G , 256 DDR*
- *40G Hard Drive,*
- *DVD-ROM & CD-RW*
- *14.1 TFT, 56K/10/100 LAN*
- *TV Out/USB/1394 Firewire*
- *ATI Mobility Radeon 7000*
- *Optical Mouse,*
- *Deluxe Carry Bay*
- *MS Windows XP PRO*

$3239

ASUS L3

Revolutionary Performance & Flexibility

- *Intel P4-2.0G, 256 DDR*
- *40G Hard Drive,*
- *DVD & CDRW*
- *15.1 TFT, 56K/10/100 LAN*
- *TV Out/USB/1394 Firewire*
- *ATI Mobility Radeon 7500*
- *Optical Mouse,*
- *Deluxe Carry Bay*
- *MS Windows XP Pro*

$3769



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Tel: (02) 95192888 Fax: (02) 95192700 **ADDRESS**: 3/53-57 Burrows RD, Alexandria, NSW 2015

Warranty:All system come with 12 months parts and 5 years labour RTB Warranty. All prices include GST, exclude freight costs, and are subject to change without notice. Stocks a limited. Errors and ommisions excepted. Rental rates are based on 36 months contract. Optional up to 4 years parts warranty for rental customers.

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SHOP 5 10-12 Clarke Street Crows Nest NSW 2065 Email: sales@ticomputers.com.au

www.ticomputers.com.au

TI Pro Intel Server Pack

Dual Intel Xeon 2G (2xCPU) $3,795
Dual Intel Xeon 2.2G (2xCPU) $3,925
Dual Intel Xeon 2.4G (2xCPU) $4,025

Intel Clear Water SCSI M/B Dual Xeon
Built in SCSI and Intel 10/100 and SVGA
3.5" FDD Panasonic
512MbDDR RAM PC2100 ECC Reg
36GB Seagate 10,000rpm SCSI HDD
Intel Hudson 3 SU Server Case 450w
Ps II Keyboard & Optical Wheel Mouse
Add Monitor from Monitor List
Mitsubishi Diamond 40 x 12 x 48 CD-RW
Built in SCSI U160 and 64 Bit PCI
System set up as 4 x CPU

TI AMD Server Deluxe

AMD Athlon XP 1800+ $1,660
AMD Athlon XP 2000+ $1,710
AMD Athlon XP 2100+ $1,795
AMD Athlon XP 2200+ $1,625
GA YAXP VIA KT400 USB 2.0
Raid Control +10/100 Lan + Firewire 1394
3.5" FDD Panasonic
Leadtek Geforce 4 TI 4200 DDR VIVO
256Mb DDR RAM Kingmax 333MHZ
80GB Seagate 7200rpm
TI Deluxe Server Case 350W Power
Add Monitor from Monitor List
MS Internet Keyboard & Intelimouse
Pioneer 16 Speed DVD
LG or Diamond 40 x 12 x 48 CD-RW
Creative DE 5.1+ Subwoofer Speakers

TI P4 Value Pack

Pentium 4 1.7Ghz $1,045
Pentium 4 2.0Ghz $1,125
Pentium 4 2.4Ghz 533FSB $1,198
Pentium 4 2.53Ghz 533FSB $1,298
Pentium 4 2.8Ghz 533FSB $1,830
Intel P4 D845GBV 533FSB USB2.0
256Mb DDR RAM PC2100 Kingston
64Mb Geforce 4 Ti4400 Avadonia 4 7200rpm
3.5" FDD Panasonic
A-Open KF 4S Pentium 4 Socket
Built in Video, Sound, Modem, Lan
Acer PS II Keyboard & Mouse
Add Monitor from Monitor List
LG or Diamond 40 x 12 x 48 CD-RW
Built in Sound Card
320W Power Speakers

CPU

Pentium 1.7G Celeron Intel CPU $565
Pentium 4 1.7GHZ $275
Pentium 4 2.0GHZ $355
Pentium 4 2.4GHZ 533FSB $430
Pentium 4 2.53GHZ 533FSB $535
Pentium 4 2.8GHZ 533FSB $840
Pentium 4 2.8GHZ 533FSB $1,040
Intel Xeon 2.4G Intel CPU $578

AMD
AMD Athlon XP 1800+ Fan $185
AMD Athlon XP 2000+ Fan $235
AMD Athlon XP 2100+ Fan $288
AMD Athlon XP 2200+ Fan $358
AMD Athlon MP 2000 Fan $335
AMD Athlon MP 2100 Fan $415
CPU Fan For AMD Cooler Master or Taso $25

Switch

Skylink 8 Port 10/100 Switch $95
Skylink 16 Port 10/100 Switch $185
Netgear FVS318 $445
Netgear FV516 $1,380
Acton Router 4 port switch 188

Sony Digital Camera

FDD & CD Mavica Cameras
Sony MVCFD-75 FDD Digital $835
Sony MVCFD-100 1.2M $1,025
Sony MVCCD250 2.0M CDRW $1,599
Sony MVCCD400 4.0M CDRW $1,825
Cyber-Shot
DSCP31 Compact 2.0 Mill $515
DSCP51 Compact 2.0 Mill $599
DSCP71 Compact 3.2M $849
DSCP7 Ultra Compact 3.2M $1,080
DSCP9 Ultra Compact 4.0M $1,340
DSCS75 Powerful 3.2M Digital Handycam $1,140
DCRTRV140 Digital8 Handycam $1,025
DCRTRV340 Digital8 Handycam $1,245
DCRTRV16 MiniDV Handycam $1,330
DCRTRV18 MiniDV Handycam $1,485
DCRTRV27 Mega Pixel MiniDV $2,035
DCRPC101 Compact Mega Pixel $495
DCRPC120 1.5MP Network $3,285

TI Athlon Deluxe

Dual AMD Athlon MP1900 $2,275
Dual AMD Athlon MP2000 $2,315
Dual AMD Athlon MP2200 $2,470

TYAN AMD Dual **S2466-4M** 10/100
Big Cooler Fan & Heat Sink
3.5" FDD Panasonic
512Mb DDR RAM PC2100 ECC Reg
80GB Seagate 7200rpm ATA 100
A-Open H600Deluxe Case 300W
Add Monitor from Monitor List
64Mb DDR Geforce 4 Mx440 TV Out
Ps II K/B & Logitech Optical Mouse
40 x12x48 CD-RW LG or Diamond
Creative DE 5.1 PCI Sound Card
320W Subwoofer Speaker

TI AMD Value Pack

AMD Athlon XP 1800+ $945
AMD Athlon XP 2000+ $980
AMD Athlon XP 2100+ $1,045
AMD Athlon XP 2200+ $1,135

GA TVAX VIA KT400 USB 2.0
256Mb DDRAM PC2100 Kingston
40GB Seagate 7200rpm ATA 100
A-Open Deluxe KF-4S ATA Case
Add Monitor from Monitor List
64Mb Geforce 4 Ti MX400
PS II Acer Keyboard & Wheel Mouse
52 Speed Acer CD-ROM
Built in 3D Sound Card
3.5" FDD Panasonic
120W Power Speaker

TI P4 Deluxe Pack

Pentium 4 1.7Ghz $1,370
Pentium 4 2.0Ghz $1,460
Pentium 4 2.4Ghz 533FSB $1,525
Pentium 4 2.53Ghz 533FSB $1,625
Pentium 4 2.8Ghz 533FSB $2,165

GA 8IEXP Raid, Intel 10/100, Firewire
256Mb DDR Ram Pc2100
80Gb Seagate 7200rpm ATA100
3.5" FDD Panasonic
TI Deluxe Server Case 350W Power
64Mb Geforce 4 MX440 TV out
MS Internet KB & Intelimouse
Add Monitor from Monitor List
40 x12 x48 CD-RW Diamond
Built in Sound Card
120W Power Speakers

Memory

128MB 168Pin SD Ram PC133 $55
256Mb 168Pin SD Ram PC133 $95
256Mb DDR PC2100 Kingston $125
256Mb DDR RAM PC2700 $158
256Mb DDR Ram PC3200 $185
512Mb RD Ram PC800 $225
Special 128Mb Notebook $85
Special 256Mb Notebook $165

Hard Drive

Maxtor 40G 7200 rpm ATA133 $160
Maxtor 60G 7200 rpm ATA133 $195
Maxtor 80G 7200rpMA ATA100 $195
80G Seagate 7200rpm ATA100 $198
80GB Seagate 7200rpm ATA100 $212
120G WD 8Mb Cache 7200rpm SCSI HDD $385
IBM 36GB 10000rpm U160 $625
Seagate Cheetah
Cheetah 18Gb 10,000rpm U160 $355
Cheetah 36Gb15,000rpm U160 $758
Cheetah 36Gb 10,000rpm U160 $845
Cheetah 73Gb 10,000rpm U160 $1,145

Notebook HDD 2.5"

Fujitsu 10GB 5.5mm $185
Fujitsu 20GB 9.5mm $210
Fujitsu 30GB 9.5mm $298
Fujitsu 40GB 9.5mm $365

Scanner

HP3200 Scanner $150
HP3500 Scanner $228
HP4500 Scanner $408
HP4670 Scanner $478
Canon N1250U2 USB Scanner $210
Canon N1240U2F USB Scanner $282
Epson 1660SU Photo $348
Epson 2400 Perfection $465

Sound Card

Hercules Game TheatherXP $248
Creative Live DE 5.1 $79
Creative Audigy Platinum $398
Creative Audigy DE $175
Creative Extigy $320
1394 Firewire Card $65

TI AMD Deluxe Pack

AMD Athlon XP 1800+ $1,225
AMD Athlon XP 2000+ $1,275
AMD Athlon XP 2100+ $1,325
AMD Athlon XP 2200+ $1,385

GA TVAX VIA KT400 USB 2.0
256Mb DDR ***PC2700*** Kingmax
80GB Seagate 7200rpm ATA 133 + **7200**rpm
3.5" FDD Panasonic
TI Deluxe Server Case 350W Power
64Mb Geforce 4 MX440 TV Out
MS Ps II Keyboard & Optical Mouse
Add Monitor from Monitor List
LG or Diamond 40 x 12 x48 CD-RW
3D Sound Card
600W Subwoofer Speaker

TI P4 Deluxe Pack

Pentium 4 1.7Ghz $1,515
Pentium 4 2.0Ghz $1,599
Pentium 4 2.4Ghz 533FSB $1,665
Pentium 4 2.53Ghz 533FSB $1,765
Pentium 4 2.8Ghz 533FSB $2,285

MSI 845E MAX 2 533FSB USB 2.0 + Raid+ ATA133
256Mb DDR RAM kingston
80GB Seagate 7200rpm
3.5" FDD Panasonic
TI Deluxe Server Case 350W Power
Leadtek Geforce 4 Ti 4200 DDR VIVO
Ms Internet Keyboard & Optical Mouse
Add Monitor from Monitor List
LG or Diamond 40 x 12 x48 CD-RW
3D Sound Card + Speakers

Monitor

Hitachi 17" CM615 0.23dpi $275
Hitachi 17" CM715 0.23dpi $310
Hitachi 19" CM721 0.19dpi Flatscreen $558
Hitachi 15" CML152XW LCD $710
Hitachi 17" CML171SXW LCD $1,299
Hitachi 18" CML181SXW LCD $1,925
Acer 17" Flatscreen $255
Acer 15" LCD 502 With Speaker $440
Acer 17" LCD 702 With Speaker $1,225
Mitsubishi 19" D/View 1280 $215
Mitsubishi 17" D/View 1770 $259
Mitsubishi 19" D/View 1998 $458
Mitsubishi 21" D/View 2115E $1,250
Mitsubishi 15" DV153 LCD $756
17" Samsung SyncMaster 763DF $310
19" Samsung SyncMaster 956DF $828
17" LG 700eFT Flatscreen $360
17" Sony E230 Flatscreen $538
19" Sony G420 Flatscreen $895
Sony SDM-S51 15" LCD $645
Sony SDM-S71 17" LCD $1,540

CD-ROM/DVD

52 x CD-ROM A-Open $55
Mitsubishi 16 x Speed DVD $198
Pioneer DVR-AO4 6 in 1 $699

CD-Writer

40x12x48 CD-RW $112
Mitsubishi 32x10x40 CD-RW $153
Sony 40x12x48 CD-RW $135
Sony 48x12/32 24x10x40 $375
BenQ 40 x 12 x 48 CD-RW $108
SCSI Control Card
Adaptec 19160 Card $330
Adaptec 29160 Card $425
Adaptec 39160 Card $530

Network Card

A-Open 10/100 PCI $25
Dlink 10/100 PCI $49
3 Com Etherlink XL 10/100 PCI $95
Intel Ether Express 10/100 PCI $72
Pomcia 10/100 Kingmax real port $108
Xircom 10/100 Real port Pcmcia $295

Compaq Notebook

Presario 2815 P 4 1.8G 256m 40g CD-RW/DVD 15"TFT 64m svga 56K 10/100 $4,890
EVO N1000v P4 2.0 256m 30Gb 15" TFT CDRW/DVD 56K 10/100 W xp $3,899
EVO N1000v P4 2.0 256m 20Gb 14.1" TFT DVD 56K 10/100 W xp $3,455
EVO N1000c P4 1.7 256m 30Gb 14.1" TFT DVD 56K 10/100 W xp $3,798
EVO N1000c P4 1.8 256m 30Gb 14.1" TFT CDRW/DVD 56K 10/100 W xp $4,985
EVO N800v P4 1.6 256Mb 30Gb 15" TFT DVD 56K 10/100 W xp $3,730
EVO N800v P4 1.7 256Mb 40Gb 15" TFT DVD/CDRW 56K 10/100 W xp $4,399
Presario 1722 PIII 1G 256Mb 30Gb DVD 14.1" TFT 56k 10/100 Firewire $3,038
Presario 700 Athlon4 1G 256Mb 20Gb 8xDVD 14.1" TFT 56k 10/100 $2,930

Toshiba Notebook

Satellite 1400 P 1.2G C 128Mb 20Gb 8 x DVD 14.1" TFT 56K/10/100 W XP Pro $2,925
Satellite 2400 P4 1.6 256Mb 20Gb 8 x DVD 14.1" TFT 56K/10/100 W XP Pro $2,925
Satellite 3000 P III 1.13G 256m 20g 8xDVD 14.1" TFT 56k 10/100 Wireless W XP $3,385
Satellite Pro TE2000 PIII 1.13G 256m 20g 8xDVD 14.1"TFT 56k 10/100 W XP Pro $3,048
SatellitePro 3220 PIII 1.2G 256m 30g CD-RW/DVD 14.1"TFT 56k 10/100 WIB $3,278
SatellitePro TE2000 PIII 1.2G 256m30g CDRW/DVD 14.1"TFT 56k 10/100 XP pro $3,495
Satellite Pro 2100 P 4 1.2G 256m 30g DVD/CDRW 14.1" TFT 56k/10/100 XPPro $3,670
Satellite Pro 6100 P 4 1.6G 256m 30g DVD/CDRW 15" TFT 56k 10/100 win xp $3,850
Satellite Pro 6100 P 4 1.8G 256m 40g DVD/CDRW 15" TFT 56k/10/100 win XP $4,828
Portege 4010 PIII 933Mhz 256Mb 20Gb 56K F/M 12.1"TFT Wireless Lan XP Pro $4,699
Tecra 9100 P 4 1.8G 256m 40g DVD/CDRW 56k 14.1"TFT wireless lan XPpro $6,785

Excel Series Notebook

P4 1.7G 256m 20g 24xCD 14.1"TFT 56k 10/100 Infrared 1394Firewire TV XP $2,420
P4 1.7G 256m 20g 8xDVD 14.1"TFT 56k 10/100 Infrared 1394Firewire TV XP $2,520
P4 1.8G 256m 20g 8xDVD 15"TFT 56k 10/100 Infrared 1394Firewire TV XP $2,725
P4 2.4G 256m 20g 8xDVD 14.1"TFT 56k 10/100 Infrared 1394Firewire TV XP $3,220
Upgrade from DVD to DVD and CD-RW Combo $180
Extra External USB FDD $78
All Excel Notebook with Carry Bag **with 2yr warranty**

Motherboard

GA - 8IEXP Intel 845E 533FSB USB 2.0 Raid Firewire Intel 10/100 Sound **$289**
GA -8IE Intel 845E Chipset 533FSB USB 2.0 Built in Sound Card **$178**
GA TVAX VIA KT400 AGP 8x USB 2.0 3D Sound **$178**
GA TVAXP VIA KT400 AGP 8x USB 2.0 3D Sound 10/100 Nic 1394 Firewire **$279**
GA-7VRXP 333MHZ **DDR 10/100 Raid Control** Creative Sound **$218**
GA-7RX VIA **KT333A** Chipset USB 2.0 with Sound **$165**

ASUS Motherboard
ASUS A7V8X Motherboard VIA KT400 and AGP x 8 Raid control USB 2.0 $310
ASUS A7V8X Motherboard VIA KT400 and AGP x 8 Raid control USB 2.0 & Firewire $355
ASUS A7M-D Dual AMD with 760MPX Chipset $558
ASUS P4T533-c Pentium 4 Motherboard Socket 478 $389
ASUSTEK P4B533 intel 845E 533FSB USB 2.0 $242

MSI Motherboard
MSI 845E MAX 2 533FSB DDR USB 2.0 + Raid+ ATA 133+ 10/100 Network **$265**
MSI KT3 Ultra ARU 333 HMZ DDR USB 2.0 ATA 133 **$259**
MSI KT3 Ultra ARU 333 HMZ DDR USB 2.0 ATA 133 $205

Tyan AMD Dual Motherboard
Tyan AMD Dual S2466N-2G 10/100 Network Card $1,025
Tyan AMD Dual S2466-4M IDE Motherboard 10/100 Network $470

Intel Motherboard
Intel **845GBV 533FSB + Intel SVGA Built in + USB2.0 + Sound** $229
Intel **845GBV1 533FSB Intel SVGA USB2.0 Sound Intel 10/100** $249
Intel Pentium 4 MB Intel 845WN Chipset Socket 478 SD Ram $228
Intel **850EMV2L Intel 850E Chipset 533FSB DDR Intel 10/100** $315

SVGA Card

8Mb SIS PCI SVGA Card $59
8Mb SIS AGP SVGA Card $52

Matrox SVGA Card
Matrox G550 32m Dualhead TV **$278**
Power Colour SVGA Card
3Dfx RIVA TNT II M64 AGP $79

ASUS SVGA Card
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V8440 Geforce 4 128M Deluxe $565
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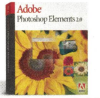
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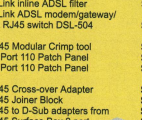


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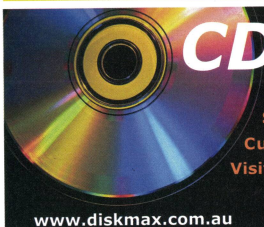
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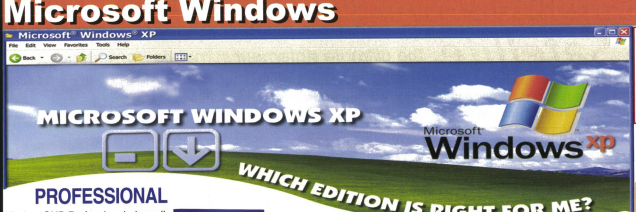
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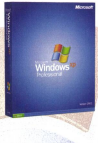
Microsoft Windows



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PROFESSIONAL

Windows® XP Professional has all the features of Windows® XP Home PLUS many added features. With its fresh, new look, to its intuitive, task-based design, XP makes it easier than ever to use your computer. Built on the solid foundation of Windows® 2000, Windows® XP Professional offers greater reliability, security, and compatibility than ever before in a business operating system.



Windows® XP Professional is right for me if ...

- I have a small business or I am an advanced user.
- I want to set up a business network or I need to join my PC (or laptop) to a domain on a server based network.
- I need enhanced security and privacy to protect my business data.
- I want to get a real-time communication tool for collaborating with customers and business partners online.

PROFESSIONAL (C9884) **$599**

PROFESSIONAL UPGRADE (C9885) **$405**

HOME EDITION

Windows® XP Home Edition gives you the freedom to discover the possibilities of your home computer. It makes your computer smarter, yet simplified, and keeps you connected to what's important to you: friends, family, the Internet, and much more. Windows® XP Home Edition offers greater dependability and privacy than ever before in a home operating system.



Windows® XP Home is right for me if ...

- I have a home computer.
- I want to experience improved performance for my computer.
- I want to enjoy the best in digital music.
- I would like to experience personal entertainment and gaming
- I would like - increased security & faster internet access

HOME EDITION (C9882) **$405**

HOME EDITION UPGRADE (C9883) **$205**

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

NEW 2003 Version



Microsoft® Encarta Premium Suite 2003

- Encarta 2003 packed with Australian content.
- Access information that changes with our changing world.
- A wealth of relevant information on virtually any subject.
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- New homework starters provide students with resources to better understand and plan for assignments.
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$100 Cashback offer

For existing owners of Encarta reference products** and owners of a competitive multimedia reference product***. Offer expires March 31, 2003 . Australian residents only, limit one per household. See cashback coupon for more details....

Available in CD & DVD Formats

CD (F8725) **$165**

DVD (F8720) **$165**

**Encarta Encyclopedia, Encarta World Atlas, Encarta World English Dictionary, Encarta Reference Suite, Encarta Reference Library (must be 2002 or earlier version)
***Encyclopaedia Britannica CD, World Book Multimedia Encyclopedia, Websters Interactive Encyclopedia.

NEW 2003 Version



Microsoft® Encarta Encyclopedia Standard 2003

- Whether doing research for school or looking for general information, Encarta makes it easy to find what your looking for.
- A wealth of current information for your whole family.
- Easily find related articles, web links, even live news and radio.
- Engaging multimedia makes learning fun!
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- "Update Encarta" ensures that the information you work with is timely and accurate.

(F8721) **$79**

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Microsoft® Encarta Encyclopedia Plus 2003

- "Update Encarta" ensures that the information you work with is timely and accurate.
- Go beyond the encyclopedia – Secondary sources are readily available through sidebars and web links.
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- Learn about the events affecting people and places with Live Media.
- Interactive Multimedia – Animation, music, videos, audio clips, photos and virtual tours encourage exploration.

(F8719) **$139**

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Satellite Power & Pocket PC

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Accessories

Universal AC Adapter (D1556) **$89**

Bluetooth PC Card (B6572) **$249**

Dobby Oxford Carry Case (C5388) **$83**

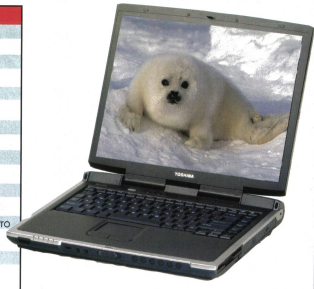
Targus USB Mobile Replicator (B4533) **$175**

Satellite

The ultimate statement in mobile computing

The award-winning series of Satellite notebook PC's offer the ideal balance in affordability and performance. Every Satellite is built with the right mix of features to help you power through your day-to-day computing requirements.

Satellite	1400	2410
PROCESSOR	Cel 1.2GHz	P4 1.7Ghz-M
RAM STD	128MB	256MB
HARD DRIVE	20GB	30GB
SCREEN	14.1"XGA TFT	14.1"XGA TFT
MAX RESOLUTION	1024 x 768	1024 x 768
POINTING DEVICE	Touch Pad	Touch Pad
CD-ROM/DVD	DVD	DVD
IEEE 1394 Firewire	no	yes
VIDEO RAM	16MB	16MB
56K v.90 & 10/100 LAN	yes	yes
WIRELESS LAN	Antenna Ready	Antenna Ready
WARRANTY	1 year	1 year
OP SYSTEM	Windows® XP Pro	Windows® XP Pro
Rent*	$24.56/wk	$Call/wk
PART NUMBER	(F1608)	(G2442)
	$2,475	**$Call**



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ALL TOSHIBA NOTEBOOKS AND ACCESSORIES SOLD FROM HARRIS TECHNOLOGY.

Pocket PC Accessories

USB Cable Connection • AC Adapter with Cable • Replacement Stylus 3Pack • Coloured Side Panel Set (4)(E570 only)

Pocket PC e330



- Intel Strongarm Xscale 300Mhz processor
- Microsoft PocketPC 2002 operating system
- 64MB of RAM & ROM
- Ultra light weight, at only 140 grams
- Ultra slim size, 125mm x 79mm x 12.4mm (HxWxD)
- Extra Bright 3.5" TFT Screen
- Long 10 hour battery life
- 72 hour data back up, when main battery is flat
- In built speakers & stereo headphone socket
- SD card slot, for additional memory or Bluetooth SD card
- Infra-red port
- Internal jog/scroll dial for easy document & web navigation
- Microphone & record button

Rent* $10.07/wk (G2443) **$899**

Pocket PC e740



- Intel PXA250 400MHz Xscale
- Microsoft PocketPC 2002 operating system
- 64MB of SDRAM, 32MB of Flash ROM
- Card slots: Secure Digital (SD), CFII card slot
- 1000mAH rechargeable lithium ion battery
- 125mm x 80mm x 16mm (HxWxD)
- Weight: 181g

Toshiba Pocket PC e740 400Mhz 64MB SD/CF Slots w/Bluetooth

- Integrated Bluetooth

Rent* $16.35/wk (F4046) **$1,459**

Toshiba Pocket PC e740 400Mhz 64MB SD/CF Slots w/WiFi

Rent* $16.90 /wk (F4047) **$1,508**

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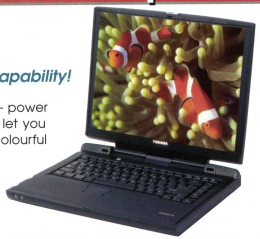
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Satellite Pro Models & Media Expansion

Satellite Pro®

Exceptional performance with wireless capability!

The Satellite Pro® series give you the best of both worlds — power and affordability. Built with just the right mix of features to let you power through day-to-day computing tasks with ease, colourful displays and powerful processors provide plenty of CPU horsepower to even the most demanding applications, while the integrated multimedia devices never leave functionality behind.



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Delivery Australia-wide

Satellite Pro	TE-2100	Satellite Pro6100	Satellite Pro6100
PROCESSOR	P4 1.7GHz	P4 1.6GHz	P4 1.8GHz
RAM STD	256MB	256MB	256MB
HARD DRIVE	40GB	30GB	40GB
SCREEN	14.1" TFT	15" TFT	15" TFT
MAX RESOLUTION	XGA	XGA	XGA
CD-ROM/DVD	DVD	DVD/CDRW	DVD/CDRW
VIDEO RAM	16MB	32MB	32MB
56K v.90 & 10/100 LAN	yes	yes	yes
WIRELESS LAN	no	no	yes
WARRANTY	1 year	1 year	1 year
Rent*	$Call/wk	$38.40/wk	$47.60/wk
WINDOWS® 2000/ XP PRO	(G2444)	(F0782)	(F0783)
	$Call	**$4,059**	**$5,158**

TOSHIBA Accessories

Black USB Mini-Mouse (C1951) **$57**

Toshiba Port Replicator (D0406) **$258**

Mini PCI Wireless LAN Card (E6784) **$279**

Toshiba Air & Auto Adapter (F1207) **$236**

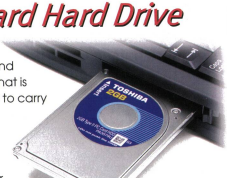
SD Media



With up to 128MB of capacity the small postage stamp sized SD card offers the easiest way to transfer data between devices. Fully compatible with the Toshiba Tecra® 9000, Portégé® 4000, Satellite Pro® 6000, Pocket PC e570, other models can accept SD memory via the PC card adapter.

32MB SD Memory Card	(E0598)	**$107**
64MB SD Memory Card	(E0600)	**$179**
128MB SD Memory Card	(E0601)	**$327**
PC Card SD Adaptor	(E6780)	**$164**

2GB PC Card Hard Drive



Easily store and share information in a small and ultra portable device that is simple to use and easy to carry anywhere.

- 4200rpm
- Max 20MB/s transfer rate host
- Max 130MB/s transfer rate disk
- Average 15ms seek time
- 256KB buffer size
- Compatible with any PC equipped with a Type II PCMCIA PC Card slot
- Support for Windows® 95/ 98/ XP/ 2000/ NT
- 5mm x 54 mm x 85.6 mm
- Weighs only 55g

(D3427) **$495**

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TOSHIBA Accessories

Portégé AC Adapter (D1209) **$99**

Portégé 256MB RAM (D0499) **$199**

Slim SelectBay HDD Adapter (D4120) **$98**

30GB HDD Drive Kit (D4104) **$535**

RENTSMART
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Portégé® 4010 Series

Ultrathin, ultralight, ultraperformance

Portege	4010-933
PROCESSOR	PIII 933MHz
RAM	256 MB
HARD DRIVE	30GB
SCREEN	12.1" XGA
MAX RESOLUTION	1024 x 768
CD-ROM/DVD	DVD
PORT REPLICATOR	optional
VIDEO RAM	16MB external
56k v.90	yes
10/100 LAN	yes
WIRELESS LAN	yes
WEIGHT	1.9kg
OP SYSTEM	WIN XP PRO/2000
WARRANTY	3 Years
Rent*	$45.72/wk (E3499)
	$4,955

The Portégé® is the ultimate statement in mobile computing with its Pentium® III power, large high resolution colour display, long battery life and easy functionality all packed into an ultra thin lightweight body (**only 2kg**) finished in sleek magnesium. With head turning style and work burning performance, the Portégé® is the perfect tool for the travelling executive ready to succeed in the new world.



Tecra® 9100 Series

The most mobility & power without compromise!

The Tecra® series is equiped for consistant mobile performance — providing you with the ultimate combination of traditional Tecra® investment benefits, high processor performance and a new sleek look and feel that you will notice. Each Tecra® comes with DVD drive standard.

For more details call Our Sales Team on 1300 13 9999 or visit www.ht.com.au/cat/toshiba



Projectors

TLP-B2 Ultra

This amazing compact projector has the profile of letter-size paper and weighs only 2.6kg. That means you can carry it with one hand and take it anywhere you go.

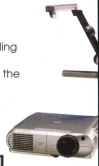


FEATURES:

- Full auto scanning for plug-and-play
- Hook-up to any laptop or workstation
- 1,250 ANSI lumens optical system
- True XGA Resolution 1024 x 768.

Rent* $55.33/wk (E4351) **$5,996**

The Toshiba 680/681 Projectors are flexible enough to deliver your presentations in style! The 681 model comes with a unique swivel and folding camera allowing projection of hard copy material. Both projectors share the following features:
Resolution: XGA 1,024 x 768,
Brightness: 1,500 ANSI Lumens,
Weight: 3.7kg for 680 and 4.4kg for the 681.



TLP-680 (without camera)
Rent* $67.51/wk
(D1732) **$7,585**

TLP-681 (with Camera)
Rent* $77.01/wk
(D1733) **$9,185**

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The Fujitsu LifeBook - "Made in Japan"

Fujitsu is renown for delivering stylish, high performance, full-featured notebooks. Our LifeBook range is "Made in Japan" – your guarantee of reliability.

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LIFEBOOK S6110 Ultra Slim

The ideal corporate notebook offering a host of hot swappable optional devices, large screen in an ultra slim form factor. Microsoft® Windows® XP Professional is standard on the S6110.

- Hot Swappable Mobile Bay
- 13.3" XGA TFT Colour Display
- Integrated VGA (Max 48MB w/IDMS) with 3D Graphics Accelerator and MPEG-2 Support
- Integrated V.90 modem & 10/100Mbps Base-T LAN
- Port Replicator
- Approx. 1.71kg (with optional Weight Saver)



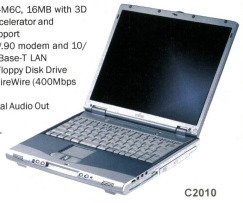
S6110

Processor	Pentium III 1.2GHz-M SS	Pentium III 1.2GHz-M SS
RAM	256MB	512MB
HDD	30GB	40GB
Drive	CD-RW	DVD/CD-RW
LAN	Wireless LAN Antenna Only	Yes- 802.11b
USB 2.0	Yes	Yes
Rent*	$40.58/wk	$46.03/wk
Part #	(G2456)	(G2466)
	$4,289	**$4,988**

LIFEBOOK C2010/C2111 Multimedia

The multimedia desktop replacement utilising Intel's Pentium 4 CPU.

- ATI Mobility-M6C, 16MB with 3D Graphics Accelerator and MPEG-2 Support
- Integrated V.90 modem and 10/100 Mbps Base-T LAN
- Integrated Floppy Disk Drive
- IEEE1394 FireWire (400Mbps high speed)
- Optical Digital Audio Out (SPDIF)
- S-Video Out.



C2010

Model	C2010	C2111
Processor	Pentium 4 1.8GHz-M SS	Pentium 4 1.8GHz-M SS
RAM	256MB SDRAM DDR	256MB SDRAM DDR
HDD	30GB	40GB
Drive	CD-RW	DVD/CD-RW
Screen	14.1" XGA TFT	15" XGA TFT
OS	Microsoft® XP Home	Microsoft® XP Home
Rent*	$34.72/wk	$42.56/wk
Part #	(F9920)	(F9921)
	$3,499	**$4,499**

LIFEBOOK P1110/P2110 Ultra Portable

The P1110 with the portability of a PDA at only 880g, is a fully-fledged notebook running Microsoft® Windows® XP.

- Integrated V.90 modem and 10/100Mbps Base-T LAN
- The ultra portable LifeBook P2110 boasts the addition of a built-in combo drive for extra flexibility and functionality.

P2110 Also Includes:

- Optical Digital Audio Out (SPDIF)
- S-Video out.



P1110

Model	P1110	P2110
Processor	Crusoe 733MHz	Crusoe 867MHz
RAM	256MB	256MB
HDD	20GB	30GB
Drive	Ext CD	DVD/CD-RW
Screen	8.9" TFT	10.6" XGA TFT
OS	Microsoft® XP Home	Microsoft® XP Home
Rent*	$33.63/wk	$40.58/wk
Part #	(F3594)	(F3592)
	$3,389	**$4,289**

FUJITSU

Accessories

Bluetooth card (G2760) **$298**

S Series Port Replicator (F7885) **$198**

Extended 3-Year Warranty (F4383) **$299**

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- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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For all your short term computer hire needs

KWIKTRON

Kwiktron's vast inventory of the latest equipment is in-stock and ready for immediate delivery.

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NEC Versa M300

- Intel® **Pentium® 4** 1.7GHz **Mobile**
- 256MB DDRAM
- 14.1" XGA TFT 1024 x 768 resolution
- 32MB shared video memory
- 30GB HDD
- DVD ROM
- Integrated FDD
- **Weight less than 3kg**
- 3 x USB, 1 x IEEE 1394, parallel and serial, TV-Out, VGA
- Onboard modem and LAN
- Dimensions 330 x 274.5 x 36.5 ~ 38 mm
- Microsoft® Windows® XP Professional plus more

Rent* $31.75/wk (G2187)

$3,199



The Versa M300 gives you the power you need, at an affordable price

NEC Versa E120

- Intel® **Pentium® III** 933MHz **Mobile**
- Intel® SpeedStep™ Technology
- 256MB RAM
- 12.1" XGA TFT 1024 x 768 resolution
- Embedded video chipset 16MB shared video memory
- 30GB UDMA HDD
- CDRW
- External USB FDD
- Weight 1.39kg
- 3 x USB 2.0 ports
- IEEE 1394 Firewire
- PCMCIA and CF II card slot
- Onboard 56k V.90 modem + LAN
- Dolby 5.1 and Dolby 7.1
- Dimensions 270 x 222 x 18.5 ~ 23.7 mm
- Microsoft® Windows® XP Professional, Norton Antivirus, Sun StarOffice 5.2, Videowave, PhotoSuite and more...

Rent* $37.74/wk (G1678)

$3,989



The Versa E120 ***ROAD WARRIOR***, designed for the business executive with ultra high speed interfaces – up to 480Mbps, using the latest USB 2.0, a featherweight 1.39kg and exceptional battery life.

NEC MobilePro 300E

- **Intel® 206MHz Strong Arm SA-1110**
- **64MB RAM onboard**
- **32MB Flash ROM**
- **Weighs only 146g**
- **Range of accessories including expansion jacket, USB Direct Sync cable and spare battery**
- **QVGA 3.5 inch touch display - 65,536 colours**
- **Removable Li-Ion battery**
- **Onboard backup battery**
- USB cradle
- SD card expansion slot
- Microsoft® Pocket PC 2002

Rent* $8.95/wk (F1754)

$799



Extend your working hours with this stylish, light weight Pocket PC. The USB cradle has an extra battery slot, so you can charge two batteries at once, one on the unit and a spare.

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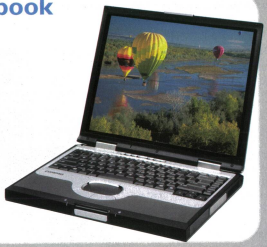
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Notebooks

Compaq Evo N800v Notebook

Light weight mobile P4 notebook - only 2.6kg

- Mobile Pentium 4 1.7GHz-M with SpeedStep technology
- 15.0" CTFT 1400 x 1050 display
- 40GB HDD
- 64MB video RAM
- 256MB DDR SDRAM, expandable to 1024MB
- ATI 32MB Mobility Radeon 7500 video chipset
- optional 3.5" 1.44MB FDD
- CD-RW / DVD-ROM combo drive
- Integrated Mini PCI v.92/56K modem and NIC combo
- Microsoft Windows XP Professional

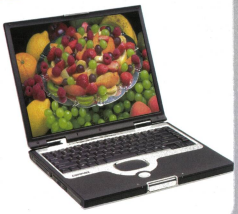


Rent* $42.52/wk (F1846) **$4,495**

Compaq Evo N1000c Notebook

Get mobile

- Mobile Pentium 4 1.7GHz-M with SpeedStep technology
- 14.1" CTFT 1024 x 768 display
- 30GB HDD
- 256MB DDR SDRAM, expandable to 1024MB
- ATI 32MB Mobility Radeon 7500, 64bit video graphics,
- 3.5" 1.44MB Diskette drive
- 8x DVD-ROM drive
- Dual battery support for over 5 hours of battery life
- Integrated Mini PCI v.92/56K modem and ethernet
- Microsoft Windows XP Professional
- 3 year courier pick-up warranty

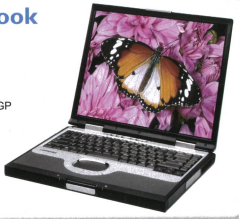


Rent* $37.77/wk (F1850) **$3,992**

Compaq Evo N1000v Notebook

Great value in an all-in-one notebook

- Intel Celeron 1.5GHz processor
- 14.1" CTFT 1024 x 768 Display
- 20GB HDD
- 256MB DDR SDRAM, expandable to 1024MB
- ATI Mobility Radeon 7500 video chipset, 32MB DDR SDRAM, 4X AGP
- 3.5" 1.44MB FDD
- 8x DVD-ROM drive
- Integrated Mini PCI v.92/56K modem
- Microsoft Windows XP Professional
- 1 year courier pick-up warranty



Rent* $27.73/wk (F1858) **$2,794**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery*. HARRIS TECHNOLOGY. *Delivery charges extra.

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Web Direct www.ht.com.au/cat/hp

Complete Server Solutions

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Ask About... EXTENDED HARRIS WARRANTY

Compaq Services Carepaq Upgrades: Installation from Microsoft Operating System Application Telephone Support

Pack-10 (D6479) **$1,699**

Pack-25 (D6480) **$4,285**

hp server tc2110 Series

Business server at a desktop price

P5530A **hp server tc 2110 P4 2.0GHz 40GB IDE**

Features

- Intel Pentium 4 2.0GHz with 512KB L2 Cache
- 128MB SDRAM (1.5GB max), 256KB L2 cache
- 48x CD-ROM
- 40GB IDE HDD,
- FDD, Dual-channel U33/66/100 IDE controller
- 3 PCI slots
- 10/100TX LAN
- 3 year next business day, on-site warranty on parts

Rent* $20.16/wk (F9323)

$1,795



Image for Illustration purposes only.

P5529A **hp server tc 2110 P4 2.0GHz 18GB SCSI**

Features

- Intel Pentium 4 2.0GHz with 512KB L2 Cache
- 128MB SDRAM (1.5GB max), 256KB L2 cache
- 48x CD-ROM
- 18GB Ultra3 SCSI HDD
- FDD, single-channel Ultra 3 SCSI controller
- 10/100TX LAN, 6 shelves
- 2 full-length PCI slots
- startup CD & toptools for servers
- 3 year next business day, on-site warranty on parts

Rent* $23.48/wk (F9321)

$2,195



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Compaq ProLiant ML310 NEW Branch office solution

For growing businesses running sophisticated small applications and branch offices of larger organisations that need a platform for single-function solutions. Choosing a ProLiant server is making an investment in your company's future.

- Intel Pentium 4 2.0GHz or 2.2GHz processor – 1P
- 4GB DDR RAM maximum memory capacity
- Single-channel Ultra3 SCSI or dual channel ATA100 with integrated ATA RAID 10/100/1000
- Standard 40GB ATA HDD or 18GB SCSI HDD with 2 HDD bays
- 1 year warranty with optional upgrade to 3 years

ML310 P4 2.0GHz 18GB SCSI Rent* $30.42/wk (G2486) **$3,065**

ML310 P4 2.0GHz 40GB ATA Rent* $25.48/wk (G2487) **$2,568**

ML310 P4 2.2GHz 40GB ATA Rent* $27.48/wk (G2489) **$2,769**

ML310 P4 2.2GHz 18GB SCSI Rent* $31.41/wk (G2488) **$3,165**



Compaq ProLiant ML350 G3 NEW Affordable 2-way performance

- Intel Xeon 2.0GHz or 2.2GHz processors
- ServerWorks grand champions LE chipset
- 256MB RAM standard on base models, 512MB, 8GB max, interleaving capable
- Five expansion slots, four 64bit 100MHz PCI-X and one 32bit 33MHz PCI
- Tool-free quick deploy rails on rack models
- 3 year onsite warranty

The affordable 2-way performance of the ML350G3 delivers the perfect balance of price, performance and availability increasing workgroup productivity without breaking your budget.

ML350 G3 2.0GHz Tower Model Rent* $39.29/wk (G2741) **$4,153**

ML350 G3 2.0GHz Rack Model Rent* $41.99/wk (G2743) **$4,438**

ML350 G3 2.2GHz Tower Model Rent* $41.03/wk (G2744) **$4,337**

ML350 G3 2.2GHz Rack Model Rent* $46.50/wk (G2745) **$4,915**



Compaq ProLiant ML370 G3 NEW Ideal for corporate environments

Integrated Virtual Presence and tool-free serviceability ideal for corporate environments!

- Up to 2.4GHz Intel Xeon Processors
- 512MB Standard
- Up to 12GB DDR Memory
- 6 open PCI-X 64 Bits/100 MHz slots
- Up to 8 hard (hot plug) drive bays - RAID on Motherboard capability
- iLO Integrated Lights-out management (remote management) on motherboard
- 3 year onsite warranty

The most versatile 2-way expansion server with industry leading management and serviceability for corporate data centers and remote sites.

ML370 G3 P2.4GHz Tower Model Rent* $52.29/wk (G2747) **$5,667**

ML370 G3 P2.4GHz Rack Model Rent* $58.31/wk (G2748) **$6,319**



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KWIKTRON

Kwiktron's vast inventory of the latest equipment is in-stock and ready for immediate delivery.

02 9774 8666

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hp Networks & Storage

NEXT BUSINESS DAY ADVANCE REPLACEMENT - LIFETIME WARRANTY
*****PLEASE NOTE THAT PRICES ARE SUBJECT TO CHANGE ON ALL PRODUCTS*****

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*Delivery charges extra.

hp procurve switch 5300xl Series

J4849A **hp procurve switch 5348xl** Designed to accommodate the most demanding network needs, the new HP Procurve Switch 5300xl series delivers the fastest layer 2/3/4 switches for the price of competitor's layer 2 modular switches. The Switch 5348xl series offers scalable, layer 3 wire-speed switching in a compact, 4-slot modular form factor with a 76.8Gbps non-blocking crossbar switching fabric, 24mpps and pre-configured with 48 10/100 ports. The easy-to-use Switch 5300xl series is the latest in technology with unparalleled investment protection and lowest total cost of ownership


hp procurve switch 5348xl
Rent* $76.93/wk
(E8120) **$9,175**

J4848A **hp procurve switch 5372xl** Designed to accommodate the most demanding network needs, the new HP Procurve Switch 5300xl series delivers the fastest layer 2/3/4 switches for the price of competitor's layer 2 modular switches. The Switch 5372xl series offers scalable, layer 3 wire-speed switching in a compact, 8-slot modular form factor with a 76.8Gbps non-blocking crossbar switching fabric, 48mpps and pre-configured with 72 10/100 ports. These convergence-ready switches provide flexibility, high port density, free software upgrades, and a lifetime warranty. The easy-to-use Switch 5300xl series is the latest in technology with unparalleled investment protection and lowest total cost of ownership


hp procurve switch 5372xl
Rent* $112.23/wk
(E8121) **$13,845**


hp procurve switch 408
Unmanaged 8 port 10/100 switch in a compact sized package. This switch offers half/full duplex, 10/100 autosensing on every port. Warranty: Lifetime, Exchange Next Day
(C9017) **$385**

hp procurve switch 2124, 2512 & 2524

J4868A **hp procurve switch 2124** Low-cost, unmanaged 24-port switch with 10/100-TX autosensing per port and one open transceiver slot for 100Base-FX uplink. The HP Procurve switch 2124 offers HP Auto-MDIX on all 10/100-TX ports, and is ideal for low cost unmanaged connectivity.


hp procurve switch 2124
Rent* $12.95/wk (D1512) **$1,156**

J4812A **hp procurve switch 2512** The Hewlett-Packard ProCurve 2512 is a high-speed 12-port managed switch with 2 transceiver slots, offering high performance, security, easy management, and some advanced features at an affordable price. The optional transceivers give you the flexibility of adding Gigabit Ethernet or 100-Mbit fibre.


hp procurve switch 2512
Rent* $19.04/wk (A9703) **$1,699**

J4813A **hp procurve switch 2524** The Hewlett-Packard ProCurve 2524 is a high-speed 24-port managed switch with 2 transceiver slots, offering high performance, security, easy management, and some advanced features at an affordable port. The optional transceivers give you the flexibility of adding Gigabit Ethernet or 100-Mbit fibre.


hp procurve switch 2524
Rent* $24.60/wk (B0062) **$2,195**

NEW! HP Storage

C5686A, C5687B **hp Surestore dat 40** The HP Surestore DAT40 addresses the evolving backup needs of an exceptionally wide range of organisations and networks. It features a ground-breaking combination of speed and reliability in a cost-effective 40 GB backup for servers and workstations


C5686A
Internal Rent* $23.48/wk
(83310) **$2,095**
C5687B
External Rent* $25.45/wk
(G2477) **$2,565**

C7400A, C7401B **hp Surestore Ultrium 230** This ultra-fast LTO drive stores 100 GB (native capacity) of data on a single tape. With a transfer rate of up to 108 GB/hr the HP Surestore Ultrium 230 delivers the best performance even when the server can't match the drive's speed, by adjusting the tape speed to optimise data streaming. The Ultrium 230 now comes with HP One-Button Disaster Recovery (OBDR) software.


C7400A **Internal** Rent* $78.17/wk
(C4269) **$9,323**
C7401B **External** Rent* $83.63/wk
(G2480) **$9,974**

hp StorageWorks SDLT 160/320 GB Tape Drive Offering 160GB native capacity, and 16MB/s transfer rate, businesses can lower total costs of ownership by reducing the number of data cartridges required and by shrinking the backup window for business-critical data. In addition, backward-read compatibility to existing DLT and SDLT-based solutions provides the highest level of investment protection while offering a smooth transition path to new SDLT 160/320-based data protection solutions.


Internal Rent* $82.37/wk
(G2481) **$9,824**
External Rent* $90.35/wk
(G2481) **$10,775**

Web Direct
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DVD Media



hp DVD+R media single with jewel case
(G0318) **$13**



hp DVD+RW media single with jewel case
(D4024) **$28**

iPAQ Mobility Pack



① ② ③ ④

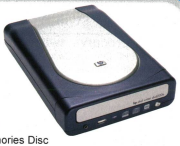
⑤ Screen Protector

1. Thumbpad keyboard
2. Combo case
3. Stylus- 1 pack
4. Car/ sync charger (cable)
5. Screen protector

(G2746) **$195**

hp DVD Writer 200e

DVD+RW technology will open up limitless possibilities with creating, preserving and sharing your memories digitally



- DVD – 2.4x write, 2.4x re-write, 8x read.
- CD – 12x write, 10x re-write, 32x read.
- Buffering – 2MB.
- Interface – external, IEEE 1394 (or ilink)/ USB 2.0.

Software included – HP MyDVD Video by Sonic, ArcSoft Showbiz, HP RecordNow, HP DLA and HP Simple Backup powered by Veritas, HP Memories Disc Creator, PowerDVD by CyberLink, MusicMatch Jukebox, ArcSoft Multimedia Email.

Rent* $13.43/wk (F1791) **$1,199**

hp DVD Writer 200i

The new generation storage technology



- DVD – 2.4x write, 2.4x re-write, 8x read.
- CD – 12x write, 10x re-write, 32x read.
- Buffering – 2MB.
- Interface – internal, 40pin IDE/ ATAPI.

Software included – HP MyDVD Video by Sonic, ArcSoft Showbiz, HP RecordNow, HP DLA and HP Simple Backup powered by Veritas, HP Memories Disc Creator, PowerDVD by CyberLink, MusicMatch Jukebox, ArcSoft Multimedia Email.

Rent* $11.19/wk (F1751) **$999**

Compaq Evo D380mx with 17" monitor



- Intel® Pentium® 4 2.0GHz.
- 40GB HDD + 52x CD-ROM.
- 17" S7500 monitor.
- 128MB RAM.
- Integrated Intel® 10/100 NIC.
- Includes fast, new USB 2.0 + front panel I/O.
- Microsoft® Windows® XP Home or XP Professional.
- 3 year warranty (parts), 1 year on-site.

XP Home Rent* $17.92/wk (G0421) **$1,597**

XP Pro Rent* $19.60/wk (G0422) **$1,749**

Compaq iPAQ Pocket PC H3970

The No.1 Pocket PC now with inbuilt Bluetooth for wireless communication



- Intel 400MHz X-Scale.
- 64MB RAM, 48MB ROM.
- Integrated Bluetooth.
- Increased battery life.
- Integrated SD slot - SD input/output ready.
- Ultrabright transflective TFT screen with 65K colours.
- Includes: universal (USB/Serial) docking cradle, AC Adaptor.
- Microsoft® Pocket PC 2002.

Rent* $15.68/wk (F4394) **$1,397**

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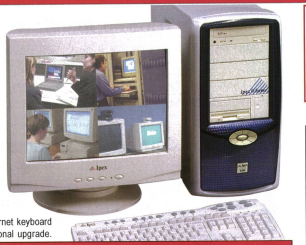
Ipex- Largest Australian PC Maker!

The Ipex T400 is ideal for the small business user looking for a system with superior performance and expansion capabilities!



With more than 18 successful years in the IT industry, Ipex is ranked in the top 20 IT companies and top 5 Desktop/Server manufacturers in Australia. Ipex offer systems to best suit your computing needs at a cost effective price.

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Internet keyboard optional upgrade.

Ipex recommends Microsoft® Windows® XP.

IPEX INTEL® PENTIUM® 4 SYSTEMS

Form Factor	Altair T400 Tower	Altair T400 Tower	Altair T400 Tower
Processor	Intel® Pentium® 4 2.0GHz	Intel® Pentium® 4 2.0GHz	Intel® Pentium® 4 2.4GHz
RAM	256MB DDR	512MB DDR	512MB DDR
HDD	60GB @ 7200RPM	80GB @ 7200RPM	80GB @ 7200RPM
Multimedia	CD/RW, DVD	CD/RW, DVD	CD/RW, DVD
Graphics	Onboard	GF4 MX440 32MB	GF4 MX440 64MB
Sound	Onboard	Onboard	Onboard
LAN	Onboard	Onboard	Onboard
Modem	Internal 56K	Internal 56K	Internal 56K
Peripherals	Optical Mouse	Opt Mouse, Wireless K/B	Opt Mouse, Wireless K/B
Warranty	1 Year RTB	1 Year RTB	1 Year RTB
OS	**Windows® XP Home**	**Windows® XP Home**	**Windows® XP Home**
Software	Works 6.0	Works 6.0	Works 6.0
Monitor	17" CRT	17" CRT	17" CRT
Rent*	$23.50/wk	$24.80/wk	$25.75/wk
Part #	(G0234)	(G0232)	(G0235)
	$2,097	**$2,499**	**$2,595**
Monitor	15" TFT	15" TFT	15" TFT
Rent*	$26.74/wk	$30.75/wk	$31.73/wk
Part #	(G0329)	(G0330)	(G0328)
	$2,695	**$3,099**	**$3,197**

Need to configure PC to your own needs? Call Harris Technology on 1300 13 9999

Upgrade your IPEX PC to the following Microsoft® software suites

Microsoft® Works Suite 2002
- Word 2002 • Encarta Standard 2002
- Money 2002 • Picture It! Photo 2002

Microsoft® Office XP Small Business Edition
- Word 2002 • Excel 2002 • Outlook 2002
- Publisher 2002

Microsoft® Office XP Professional
- Word 2002 • Excel 2002 • Outlook 2002
- Publisher 2002 • Access 2002

Call Harris Technology on 1300 13 9999 for more information

IPEX LCD FLAT SCREEN MONITORS



IPEX 15" LCD

•Refresh Rates: Horizontal: 24 - 60Hz, Vertical: 56 - 85Hz •Resolution: 1024 x 768 @ 75Hz •Viewable display area: 307mm H x 230mm V •Multimedia with tilt & swivel base.

Rent* $10.07/wk (C9400)

$899

Images for illustration purposes only



IPEX 17" LCD

•Refresh Rates: Horizontal: 24 - 80Hz, Vertical: 56 - 85Hz •Resolution: 1024 x 768 @ 75Hz, 1280 x 1024 @ 60Hz •Viewable display area: 337mm H x 270mm V.

Rent* $15.65/wk (C9401)

$1,397

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SONY

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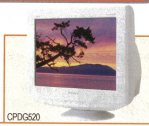
Portable Digital Solutions

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Flat Display Trintron Monitors

CPDG420 - •19" FD Trinitron display •0.24-0.25mm Aperture Grille •USB Hub •15 Pin Mini D-sub input •5 BNC input •Monitors include 3 year warranty.
Rent* $11.19/wk (B7964) **$999**

CPDG520 - •21" FD Trinitron display •0.24mm aperture grille •USB Hub •15 Pin Mini D-sub Input •5 BNC input •Monitors include 3 year warranty.
Rent* $23.51/wk (B7966) **$2,098**


CPDG520

Digital Still Cameras Cyber-shot MEMORY STICK


DSCP71

DSCP51 - 2.0MP, 2x Optical, 6x precision digital zoom, MPEG Movie HQX, E-mail mode, intelligent flash (red-eye reduction), white balance (auto, daylight, cloudy), USB Interface.
Rent* $7.00/wk (F1233) **$615**

DSCP7 - 3.2MP, 3x optical (6x digital) zoom, 1.5" LCD screen, MPEG Movie HQX, ISO sensitivity setting, AF illuminator, USB.
Rent* $13.39/wk (F8241) **$1,195**

DSCP31 - 2.0MP, 3x digital zoom,1.6" LCD screen, MPEG Movie HQX, clip motion, NiMH battery system, USB.
(F1093) **$539**

DSCP71 - 3.2MP, 3x optical (6x digital) zoom, 1.5" colour LCD, MPEG Movie HQX, ISO sensitivity setting, AF illuminator, USB.
Rent* $10.48/wk (E7751) **$935**

SONY
USB Storage Device
MICRO VAULT



Plugs directly into a USB Port. Plug and Play interface, Security Zone software allows password protection of data when using Windows 2000 & XP.

USM16 - 16MB RAM (E4136) **$99**
USM32 - 32MB RAM (pictured) (E4140) **$139**
USM64 - 64MB RAM (E4141) **$199**
USM128 - 128MB RAM (E4142) **$289**

LCD Monitors

Monitors include Sony 3 Year Warranty.

SDMS71
- 17" SXGA display.
- 350:1 contrast ratio.
- 0.264mm pixel pitch.
- Resolution:1280 x 1024.

Rent* $19.02/wk (F7881) **$1,697**

SDMS51
- 15" XGA display.
- 300:1 contrast ratio.
- 0.297mm pixel pitch.
- Wall mountable.

Rent* $10.74/wk (E7756) **$959**


SDMS71

SDMX72
- 17" SXGA display.
- 400:1 contrast ratio.
- Mini D-sub and DVI-D input.
- Resolution:1280 x 1024.
- Built-in speakers.

Rent* $21.61/wk (F9284) **$1,928**

Projectors

Ultra Portable Projectors


VPLCS5

VPLCS5
- SVGA display.
- 1800 ANSI lumens.
- Freeze function.
- Image flip (for installation capability).
- Digitial keystone correction.

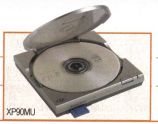
Rent* $38.08 /wk (F4553) **$4,025**

VPLCX5
- XGA display.
- 2000 ANSI lumens.
- Memory stick slot.
- Image flip (for installation capability).
- Digitial keystone correction.

Rent* $54.98 /wk (F5667) **$5,958**

CD-R/RW Drives

- CRX195A1 Internal CD burner with 40x write / 12x re-write / 48x read. (E9864) **$153**
- CRX210A1 Internal CD burner with 48x write / 12x re-write / 48x read. (G1069) **$189**
- CRXP90MU portable USB 24x CD burner with CD & DVD playback + Memory stick slot. Rent* $6.70/wk (G2184) **$598**


XP90MU

Video Cameras MEMORY STICK

DCRTRV18 - MiniDV Handycam, Carl Zeiss lens, Memory stick slot, USB streaming, MPEG Movie mode, advanced HAD technology, 2.5" LCD monitor.
Rent* $17.92/wk (F5209) **$1,599**

DCRTRV340 - Digital 8 Handycam, 25x optical zoom, Memory stick slot, USB streaming, MPEG Movie mode, electronic steady shot, super night shot.
Rent* $15.52/wk (F5211) **$1,385**


DCRTRV340

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Power, Mobility & Versatility for Home and at Work

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*Delivery charges extra.

VAIO DVD ROM CD-RW Rewritable

PCGFXA10



Rent* $28.77/wk (G2280)

$2,899

- Mobile AMD Athlon XP 1400
- MS XP Home Edition
- CD-RW / DVD-ROM Drive
- 30GB HDD, 256MB RAM
- 14.1" XGA display
- 8MB video memory
- USB & i.LINK interface
- Modem & network

VAIO DVD ROM CD-RW Rewritable

PCGGRX3P



Rent* $48.90/wk (F8191)

$5,299

- Pentium 4 1.6GHz-M
- MS XP Professional
- CD-RW/DVD combo drive
- 512MB RAM, 40GB HDD
- 16.1" UXGA display
- Memory stick slot
- USB & i.LINK interface
- Modem & network

VAIO DVD ROM CD-RW Rewritable

PCGR505TFP



Rent* $46.35/wk (G2281)

$4,899

- Ultra portable and stylish
- MS XP Professional
- 12.1" XGA display
- 60GB HDD, 256MB RAM
- Integrated wireless LAN
- Modem & network
- CD-RW/DVD-ROM drive
- USB & i.LINK interface

VAIO

CD-RW / DVD-ROM Drive Supplied

PCGC1MT1



Rent* $37.83/wk (G2437)

$3,999

DVD ROM CD-RW Rewritable

- Built-in camera
- 8.9" SXGA display
- MagicGate memory stick slot
- Internal modem
- Port replicator supplied
- Lightweight 995g

VAIO Software included with Notebooks:*

- Norton AntiVirus 2002
- Adobe Photoshop Elements
- Apple Quicktime
- Adobe Acrobat Reader
- Movie Shaker
- PictureGear
- DVgate
- SonicStage
- PictureToy

*Notebook Part No#: (G2437), (F8191) (G2280), (G2281)

Clie, greater versatility to keep the mobile professional entertained & informed

CLIÉ MagicGate Memory Stick

PEGNR70VG



- Built-in camera
- Built-in keyboard
- Built-in ATRAC3 & MP3 player
- Flip rotatable LCD display
- 320 x 480 hi-res colour display

Rent* $14.00/wk (F0918)

$1,249

CLIÉ MagicGate Memory Stick

PEGT665CG



- Ultra slim design
- Built-in ATRAC3 & MP3 player
- Earphones supplied
- 320 x 320 colour display
- MagicGate memory stick slot

Rent* $10.07 /wk (F5201)

$899

CLIÉ Memory Stick

PEGSJ20G



- Compact style
- 320 x 320 monochrome display
- Memory stick slot • Jog dial
- USB, infra-red

(F9402) **$499**

CLIÉ Memory Stick

PEGSJ30G



- Compact style
- 320 x 320 colour display
- Memory stick slot • Jog dial
- USB, infra-red

Rent* $7.83/wk

(F9401) **$699**

CLIÉ Software Supplied with CLIE:*

- World Alarm Clock
- Clie Paint
- gMovie
- PictureGear Pocket
- Photostand
- Intellisync Lite
- Documents to go

*CLIE Part No#: (F0918), (F5201) (F9402), (F9401)

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AMERICAN POWER CONVERSION

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Power Back Up = Power Protection

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PNote Pro
(99592)
$45



Surge Arrest 5 Strip
(A0098)
$55



APC Symmetra
Power Array
8kVA, exp. to 16kVA
(71087)
Rent* $113.44/wk
$13,995
So good we use it ourselves!

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APC Back-UPS ES 350/500



The new APC Back-UPS ES 350/500 is designed as an affordable battery backup to provide continued uptime and hardware protection for home and home office computer users. This product has five Australian style outlets (three battery and surge, two surge only outlets), new attractive flat design, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications and ships with file saving and auto-shutdown software. Comes with 2 years product warranty.

Back-UPS ES 350va (E1093) **$185**
Back-UPS ES 500va (E0709) **$235**

APC Back-UPS Pro® for Workstations



Smart battery backup & high performance surge suppression for Windows 95 & NT PCs

PowerChute® Plus software lets your UPS shut down your applications gracefully in the event of an extended power failure. Includes additional outle for protection of printers, audible alarms, phone/modem protection, user replaceable hot swappable batteries.

APC Back-UPS Pro 280si (76636) **$257**
APC Back-UPS Pro 420si (76637) **$349**
APC Back-UPS Pro 650si (76638) **$485**

APC Smart-UPS with USB Support



Smart-UPS 1000VA, 1500VA

Smart-UPS protects your data by supplying network-grade battery backup when power fails. With PowerChute® Plus software the uninterruptible power supply (UPS) will safely store data and shut down your network operating system before the battery is fully discharged, whether you're there or not. SmartSlot internal accessory slot allows you to install optional accessories to enhance the performance of your UPS. APC Smart-UPS is the perfect UPS for fileservers, minicomputers, UNIX CPU's, Internet hubs, telecommunications systems and other mission-critical applications.

APC Smart-UPS 1000VA Rent* $11.04/wk (D9337) **$985**
APC Smart-UPS 1500VA Rent* $14.53/wk (D4218) **$1,297**

APC NetShelter VX Black 42U Premium Equipment Enclosure



Next generation, high quality enclosure solutions designed to meet the need of today's and tomorrow's networking environment.

Features:

Adjustable mounting depth, casters, cold rolled steel, computer grade ventilation, leveling feet, lockable doors and side panels, powder coat, removeable doors and side panels, rolls through 7 ft door, roof and base cable access, ships fully assembled, equipment mounting hardware, keys, user manual.

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Intelligent KVM and USB Products

ServerLink LCD KVM Switches

With a 15" TFT LCD screen, keyboard, touchpad and integrated KVM switch housed in an industry standard 19" 1U-height rack drawer, these LCD KVM switches save you up to 1/3 of valuable rack cabinet space.





SERVERLINK LCD

LKS-101 1U Console Drawer 15" TFT LCD, KB & mouse — Rent*$40.34/wk (F7677) **$4,264**

LKS-801 8 port 1 User KVM - LCD, KB & mouse in 1U drawer — Rent*$45.21/wk (E7463) **$4,779**

LKS-802 8 port 2 User KVM - LCD, KB & mouse in 1U drawer — Rent*$46.02/wk (F7678) **$4,987**

LKS-1602 16 port 2 User KVM - LCD, KB & mouse in 2U drawer — Rent*$52.46/wk (F7679) **$5,685**

INTERGRATED KVM SWITCH

ServerLink SOHO KVM Switches

SERVERLINK SOHO



AUSTRALIAN MADE

INCLUDES ALL CABLES!

SL-251-P 2 port ServerLink inc. 2 x 2m PS2/VGA cables (E3692) **$198**

SL-451-P 4 port ServerLink inc. 4 x 2m PS2/VGA cables (E3694) **$298**

Serverlink Infinity KVM Switches

on-screen-display

SERVERLINK INFINITY



SL-221 2 port ServerLink KVM for PS2 (B3047) **$269**

SL-421 4 port ServerLink KVM for PS2 (A9890) **$349**

SL-821 8 port ServerLink KVM for PS2 Rent* $10.97/wk (97888) **$979**

SL-1621 16 port ServerLink KVM for PS2 Rent* $17.87/wk (97890) **$1,595**

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Comsol USB Storage Drives

FEATURES PASSWORD SECURITY



UT-0016 16MB Drive (G0943) **$75**

UT-0032 32MB Drive (F7691) **$95**

UT-0064 64MB Drive (F7692) **$137**

UT-0128 128MB Drive (F7693) **$235**

UT-0256 256MB Drive (F7694) **$466**

UT-0512 512MB Drive (G0944) **$789**

Comsol USB Infrared Adapter

This adapter is for enabling IrDA wireless data communication through a standard USB port. Ideal for wireless data transfer between desktop PC and notebook, PDA or mobile phone.



UIR-100 USB to IrDA Wireless Adapter (D8944) **$129**

Comsol USB 2.0 Hub - 480MBps

Connect your High-Speed USB 2.0 peripherals to your PC. Backward compatible with USB 1.1 Products.



UH-402 4 Port USB 2.0 Hub (G1938) **$87**

Comsol USB Mini Hubs

These USB Mini Hubs are small & lightweight and perfect for both notebooks & desktops



UH-201M 2 Port USB 1.1 Mini Hub (G1939) **$28**

UH-401M 4 Port USB 1.1 Mini Hub (G1940) **$39**

Comsol USB to Serial Converter

Connect serial devices to a USB port on your computer. Ideal for modems, mobile phones, digital cameras & PDAs.



UMC-100 USB to 9 Pin RS232 Serial Converter (80782) **$69**

Comsol USB Docking Station



UDS-100 Includes 2 x USB 1.1 Ports, 2 x PS/2 Ports, Printer Port, Serial Port & 10/100 Ethernet (G1942) **$223**

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USB Video Capture Adapter



UV-100 USB to Analogue Video Adapter (G1943) **$149**

USB to PS/2



UKMC-100 USB to PS/2 Keyboard & Mouse Adapter (B0557) **$69**

USB to Parallel



UPC-100 USB to IEEE-1284 Parallel Converter (82692) **$55**

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Dynalink ADSL Modems

• Lightning fast internet • Plug and play • Supports all Windows OS • Includes MF24A microfilter.



USB (B2420) **$225**

PCI (C4246) **$195**

Dynalink 56K USB Pro Modem

56USBPRO (G1594) **$167**



Dynalink Ethernet ADSL Modem and Router

• High speed ADSL for SOHO/Home • Firewall, NAT, IP Filtering, DHCP • Connect Multiple PC's to ADSL • Simple web based configuration • Includes MF24A microfilter.



RTA100 (G1771) **$329**

Dynalink 56K PCMCIA CreditCard Modem

1456VQC-T6 (E6138) **$159**



Dynalink ADSL Microfilter

In-line ADSL microfilter allows simultaneous ADSL and telephone/fax calls on a single telephone line.



MF24A (C4748) **$25**

Dynalink 56K Rural Modem II

RELIABLE connections under DIFFICULT line conditions!

The Dynalink Rural Modem II is designed to provide good connections even under "noisy" line conditions that many rural users experience.

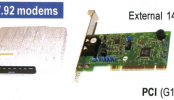


• Longer reach than standard 56K modems. • Retrains UP and down according to changes in line conditions. • Supports 2-wire leased line and security call-back. • Flash ROM upgradeable. • 2 year Back to Base Warranty.

U90E-RURAL (G1736) **$385**

Dynalink 56K V.92 modems

V.92/V.90/ K56Flex Hardware modems Data/Fax/TAM.



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PCI (G1737) **$67**

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Intel® PRO/Wireless 5000 LAN Products

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802.11a PCI Card

(F0856) **$449**



802.11a Access Point

Rent* $10.03/wk (F0857)

$895



802.11a Cardbus Adapter

(F0858) **$347**



Ramp Up To 54Mbps Wireless Speeds



802.11a Access Point & Cardbus Bundle

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$1,195

Key Features

- Replace or complement wired networks with new high-speed wireless LAN products designed for organisations of all sizes
- Choose from Intel's broad Wi-Fi* product line, optimised for notebook, desktop and handheld PCs
- Maximise your WLAN investment with products that have advanced features allowing you to easily scale network performance and coverage

Intel® PRO/Wireless 5000 LAN products create a high-performance, low-cost wireless 5GHz network that's easy to install and manage. An IEEE 802.11a-standard Wireless LAN gives you data speeds up to five times faster than comparable systems, with sufficient network capacity to handle more users, more data and high-bandwidth applications.

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An Affordable solution for the Home / Small Office

1 x NP7000 11Mbps Wireless LAN Access Point
1 x NP7030 11Mbps Wireless LAN PCMCIA
1 x NP7040 11Mbps Wireless LAN USB Adaptor
1 x NP1100 10/100Mbps Fast Ethernet PCI Card (Red & Gold Version)



SPECIAL PRICING!
Rent* $7.79/wk
(G2100) **$695**

NETCOMM CABLE / DSL ROUTERS

NB3000 Cable / DSL Wireless Router
- Built-in Telstra Cable connection
- 4-port 10/100 switch
- Easy web interface
- NAT security and Internet sharing
- Wireless range >91 metres indoors



NB3000 (F3588) **$535**

NB3100 Cable / DSL Firewall Router
- 4-port 10/100 switch
- Easy web interface
- SPI (Stateful Packet Inspection Firewall)
- Supports Denial of Service and URL filtering
- Can block all Java, Active X code and cookies
- Supports VPN, IPSec and PPTP pass through
- Supports up to 2 simultaneous VPN tunnels



NB3100 (F3589) **$354**

NB3200 Cable/DSL VPN Router
- 4-port 10/100 switch
- Easy web interface
- NAT security and Internet sharing
- Provides full IPSec VPN tunnelling and firewall protection
- Supports up to 70 simultaneous VPN tunnels



NB3200 (F3586) **$438**

NB3300 ADSL Modem Router
- 4-port 10/100 switch
- Easy web interface
- NAT security and Internet sharing
- Built-in ADSL Modem



NB3300 (F3590) **$449**

NETCOMM ADSL MODEM DESKTOP PC & LAPTOPS

- Super-fast Internet connection allows speeds up to 8Mbps download and 1Mbps upload
- Specially engineered to work with all major Australian ISPs
- USB powered - no external power supply required
- Plug and Play



SPECIAL PRICING!
NB1200 (F8602) **$199**
Bundle includes Micro Filter

NETCOMM FAST ETHERNET SWITCHES

NetComm switches deliver high performance 10/100 and Gigabit technology to both large and small networks in a compact affordable package.

16-port 10/100 auto-sensing professional switch
(incl. 19-inch rack-mount kit)
NP2160 (E7322) **$558**

24-port 10/100 auto-sensing professional switch
(incl. 19-inch rack-mount kit)
NP2240 Rent* $8.35/wk (E7323) **$745**

NEW

NP2005 **5-port 10/100 auto-sensing switch** (D0966) **$129**
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NP2080 **8-port 10/100 auto-sensing switch with internal PSU** (D0968) **$229**

NP2480 **26-port 10/100 Gigabit switch,** 24 10/100Mbps auto sensing and 2 1000Base-SX Copper Gigabit Ethernet Ports.
Rent* $20.89/wk (F9533) **$1,864**

NETCOMM FAST ETHERNET ADAPTORS



NP1100-4
High performance 32-bit 10/100 PCI LAN Card
(E7333)
$19



NP1010
USB LAN Key 10/100 Fast Ethernet Adaptor
(C7651)
$79



NP1200
10/100 Fast Ethernet 32-bit PCCard with TruConnect technology
(D1166)
$98

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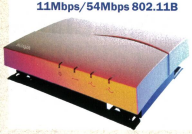
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NEW Avaya Wireless range

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Avaya™ Wireless AP-3 Access Point

11Mbps/54Mbps 802.11B

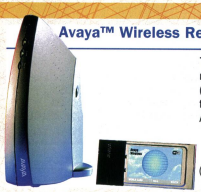


Avaya™ Wireless AP-3 Access Point extends the range of your wired ethernet network and provides a cost effective migration path to 5GHz technologies. The dual slot architecture allows you to provide both 11Mbps and/or 54Mbps connectivity for your wireless users, making this an ideal solution for enterprise customers.

Please note: PCMCIA card required (sold separately)

Rent* $15.97/wk (F9379) **$1,399**

Avaya™ Wireless Residential Gateway RG-I + Silver PCMCIA Card



The Avaya™ Wireless Residential Gateway RG-I acts as a central base station for multiple wireless users. It provides Internet sharing using Network Address Translation (NAT) & includes a built-in 56K modem. It also supports an Ethernet port that allows you to connect to a broadband cable, xDSL or ISDN modem. This bundle includes the Avaya™ wireless world PC Silver PCMCIA Card.

(G0948) **$375**

Avaya™ Wireless World PC Card Gold (128RC4) WiFi (802.11b)



The Avaya™ Wireless World PC Card Gold, makes wireless networking a practical reality in more environments than ever. Thanks to robust, secure, industry-standard 802.11b wireless networking, you can build networks that were previously far too expensive or too complex.

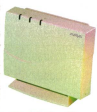
(F2031) **$99**

Avaya Communication PCI Carrier for Gold Card (does not include PC Card)

(F9377) **$145**

Avaya™ Wireless AP-1 Access Point

11Mbps 802.11b



The Avaya™ Wireless AP-1 Access Point makes wireless networking a practical reality in more places, more companies and more environments than ever. Thanks to robust, secure, industry-standard 802.11b wireless networking, you can build networks that were previously far too expensive or too complex.

(G0803) **$549**

Avaya VSU™ 5 VPN & Firewall

IncreasesRemoteWorkerProductivity



Small and home office workers can increase their productivity by using the VSU™ 5 family for secure, efficient and cost-effective access to the corporate resources they need to do their job.

VSU™ 5 Rent* $17.07/wk (G2189) **$1,490**

Ask About...

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site



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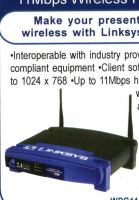
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Make your presentations wireless with Linksys WPG11 NEW

•Interoperable with industry proven IEEE 802.11b (DSSS) 2.4GHz compliant equipment •Client software included •Display resolutions up to 1024 x 768 •Up to 11Mbps high-speed transfer rate •Line of sight wireless connectivity •Low interference and high susceptibility guarantee reliable performance •Equipped with one standard VGA port for compatibility with virtually any presentation projector •Easy and quick setup •1 year limited warranty.



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EtherFast® Cable/DSL Router NEW

Connect your network to your high-speed cable or DSL Internet pipeline with the ultimate in Security and Control

HOT Price

•Connects to a broadband modem and 10/100 ethernet backbone •Use just one one IP address to access the Internet over your entire network •Configurable through your networked PC's web browser •Remote administration and remote upgrades over the Internet •Internal 4-port switch dramatically speeds up your gaming and multimedia connections •Administrators can block specific internal users' internet access with filtering •1 year limited warranty.



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Instant USB Disk™ NEW

Pocket-sized data storage with easy USB access

•Complies with USB specification 1.1 •USB plug and play connectivity •Compatible with Windows 98SE, 2000, Me or XP •Bus powered- no external power supply or battery required •Hot swappable and cable free convenience •Durable, shock resistant, solid state storage •Retains data for at least 10 years •Compact, sleek design with pocket clip and keychain hole.



USBM32M 32MB (F9118) **$109**

USBM64M 64MB (F9119) **$139**

Instant Wireless™ PCI Card NEW

Network your wireless PC

•11Mbps high speed transfer rate •Compatible with most major operating systems •Plug and play operation provides easy setup •Works with all standard Internet applications •Interoperable with IEEE 802.11b (DSSS) 2.4GHz compliant equipment •Capable of up to 128Bit WEP encryption •Free software driver upgrades •1 year limited warranty.



WMP11 (F8678) **$235**

Instant Wireless™ Network PC Card NEW

The freedom to work where you want, The flexibility to work how you want.

•11Mbps high speed transfer rate •Interoperable with IEEE 802.11b (DSSS) 2.4GHz compliant equipment •Plug and play operation provides easy set up •Long operating range (up to 120m indoor) •Advanced power management features conserve valuable notebook PC battery life •Rugged metal design with integrated antenna •Works with all standard Internet applications •Automatic load balancing and scale back •Full 1 year warranty.



WPC11 (F8681) **$185**

EtherFast™ 10/100 Switches NEW

Enjoy full-duplex, dedicated bandwidth in a new compact, modular design

•Ideal for integrating your 10BaseT and 100BaseTX network hardware •5, 8 or 16 10/100 ports provide dedicated bandwidth in half or full duplex modes •Switched 10/100 ports run at 10Mbps, 20Mbps, 100Mbps or up to 200Mbps •5 year limited warranty.



EZXS55W 5 Ports (F9068) **$95**

EZXS88W 8 Ports (F9070) **$165**

EZXS16W 16 Ports (F9071) **$269**

Wireless Access Point Router with 4-Port Switch

Connect your wired and wireless networks to the broadband Internet NEW

•Capable of up to 128-Bit WEP encryption •Supports enhanced security using NAT Firewall, ZoneAlarm Pro, and PC-cillin software •Administer and upgrade the router remotely over the Internet •Configurable as a DHCP server on your network •Advanced security management functions for port filtering and DMZ hosting •Includes one ethernet cable to connect to a cable or DSL modem •1 year limited warranty.



BEFW11S4 (F8745) **$399**

Instant Wireless™ Network Access Point NEW

The latest in wireless technology. The ultimate in network flexibility.

•High speed transfer rate of up to 11Mbps •Interoperable with IEEE 802.11b (DSSS) 2.4GHz compliant equipment •Adjustable antennas provide for physical configuration •Wireless access point roaming and bridging •IP Filtering, DHCP client and SNMP configuration utility password protection •128bit hardware WEP supported •1 year limited warranty.



WAP11 (C3175) **$349**

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switches

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FA 311 Ethernet Adapter 10/100Mps PCI (A1372) **$32**

FA 312 10/100Mbps Wake on Lan Ethernet Adapter (A1373) **$42**

FA 411 10/100Mbps PC Card (No dongle required) (B9944) **$115**

FA511 10/100Mbps CardBus PC Card (No dongle required) (D4112) **$125**


FS 105

FS 105 5 Port 10/100Mbps (84722) **$138**
FS 108 8 Port 10/100Mbps (70905) **$214**
FS 116 16 Port 10/100Mbps (A5347) **$399**

FS 516
16 Port 10/100Mbps
Rent* $7.38/wk (60522) **$659**

FS 524
24 Port 10/100Mbps
Rent* $8.95/wk (77549) **$799**

FS 524S (Stackable)
24 Port 10/100Mbps
Rent* $16.19/wk (B6540) **$1,445**

Modular Solutions

non-blocking 19" units provide 24 or 48 10/100Mbps, auto-sensing ports with Auto Uplink™ support.

FS726 24 Port
10/100Mbps, 2 Module Slots
Rent* $12.61/wk
(D0873) **$1,125**

FS750 48 Port
10/100Mbps, 2 Module Slots
Rent* $24.36//wk
(D0874) **$2,174**

AG711T
Gigabit Copper Module
Rent* $7.38/wk .
(D0921) **$659**

AG711F
Gigabit Fibre Module
Rent* $10.24/wk
(D0924) **$914**

Gigabit Solutions

GS104 4 Port 10/100/1000Mbps Gigabit Ethernet Switch
Rent* $13.39/wk
(F7306) **$1,195**

GS 508T 8 Port 10/100/1000Mbps Gigabit Switch
Rent* $23.57/wk
(B9916) **$2,375**

GS516T 16 port 10/100/1000Mbps Gigabit Switch
Rent* $36.61/wk
(D5960) **$3,689**

GS524T 24 Port 10/100/1000 Gigabit Switch
Rent* $44.42/wk
(D5961) **$4,695**

Managed Solutions

Use built-in Copper Gigabit or GBIC slots. Management includes SNMP, RMON, VLAN, QoS, port trunking, Spanning Tree, and port mirroring.

FSM 726S
Managed 24 Port
10/100Mbps Switch with 2 Stacking Ports and 2x GBIC Slots
Rent* $23.48/wk (D8885) **$2,095**

GSM 712
Managed 10 port
10/100/1000Mbps Switch with 2x GBIC Slots
Rent* $37.00/wk (F4112) **$3,728**

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print servers

PS 111W
Wireless Ready Print Server (E5833) **$205**

PS 101
1 port Mini Print Server (E5832) **$179**

PS 113
10/100Mbps Print Server, 3 Parallel Ports
(A3287) **$345**

PS 110
10/100Mbps Print Server, 2 Parallel Ports
(67226) **$259**

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NETGEAR™

Wireless & Broadband

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery. HARRIS TECHNOLOGY. *Delivery charges extra.

wireless

802.11b Products -11Mbps

MA 311
802.11b Integrated PCI Adapter
(F4339) **$195**

MA 101
11Mbps Wireless USB Adapter
(C7110) **$215**

MA401
11 Mbps PCMCIA Card
(C8117) **$179**



MA701
11Mbps Type I /II Compact Flash Card
(E5891) **$229**

ME102
11Mbps Wireless Access Point
(B9929) **$429**

FM114P
Cable/DSL ProSafe 802.11b Wireless Firewall Router, Integrated 4 Port 10/100Mbps Switch and Print Server
(F0904) **$499**

802.11a Products -54Mbps

HA 311
54Mbps Wireless Integrated PCI Adapter



(F4341) **$399**

HR 314
54Mbps Cable/DSL Wireless Router



Rent* $13.43/wk
(F4342) **$1,199**

HE 102
54Mbps Wireless Access Point



Rent* $11.04/wk
(E5824) **$985**

HA501
54Mbps Cardbus PC Card



(E5826) **$429**



GA 302T
32 bit PCI Gigabit Network Card
(D4118)
$125

GA 622T
32/64 Bit PCI Gigabit Network Card
(B9943)
$289

routers

NETGEAR have a comprehensive range of Cable/DSL routers.

All products offer standard shared internet access with NAT Firewall security and easy installation via web based configuration and DHCP. The products are plug and play and ideal for connection to either Cable/DSL or satellite broadband services. www.netgear.com.au offers specific installation information on both Telstra and Optus services.

DM 602
ADSL/USB and EthernetModem Connectivity Both in One Modem



(F9650) **$299**

RP614
Cable/DSL Web Safe Router Gateway with 4 Port 10/100Mbps Switch



(F9645) **$245**

DG814
DG814 DSL Modem Router with Integrated 4 Port 10/100Mbps switch



(F5181) **$397**

FVS318
Cable/DSL ProSafe VPN Firewall with 8 Port 10/100Mbps Switch



(F0242) **$497**

FR114P
Cable/DSL ProSafe Firewall Router, Integrated 4 Port 10/100 Switch and Print Server



(F0902) **$295**

Web Direct
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Networking Solutions

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ADSL Modem /Router *speak with the experts*

DSL-504 ADSL Router with Built-in Modem & 4 Port 10/100Mbps Switch



Best Selling

(C7593) **$429**

DSL-500 ADSL Router with Built-in Modem (D0801) **$373**

DSL-200 USB ADSL Modem, Plug and Play USB Interface with the Host PC through a USB Port (B7197) **$198**

DSL-300 Ethernet ADSL Modem (B7198) **$319**

Fly Buys. Collect Fly Buys points on your computer hardware & software when you purchase from HARRIS TECHNOLOGY.

IP Router for ADSL/Cable Modem

DI-704P IP Router for DSL/ Cable Modems with 4 Port Switch & Single Port Print Server (E5861) **$229**

DI-707P IP Router for DSL/ Cable Modems with 7 Port Switch & Single Port Print Server (E7329) **$295**

DI-713P 11Mbps Wireless Internet Gateway with 3 Port 10/100Mbps Switch & Print Server Rent* $6.49/wk (C7596) **$579**

Firewall/VPN Router

DI-804V VPN Router for Cable/ DSL. 8 VPN tunnels, DMZ, SPI, VPN Protcol PPTP & L2TP and IPSec Security (F4303) **$369**

DFL-500 Secure Firewall & VPN -20 VPN Tunnels, DMZ, SPI, IPSec Security DES & 3 DES, Content Filtering & Virus Scanning, VPN Protcol, PPTP & L2TP Rent* $11.93/wk (F0900) **$1,065**

For all your small to medium business and home network needs please call for more information and pricing. We have an extensive range of fantastic D-Link products on our database.

Managed Switch Solutions

DES-3226S
24 Port 10/100Mbps Managed Switch Stackable, Optional Gigabit or Fibre Module also Available

Image shown with DES-3226S and Stacking module DES-332GS

Rent* $16.64/wk (F9634) **$1,485**

UnManaged Switch Solutions

DES-1005D 5 Port 10/100Mbps Fast Ethernet Unmanaged Switch (85101) **$98**

DES-1008D 8 Port 10/100Mbps Fast Ethernet Unmanaged Switch (98254) **$149**

DES-1016D 16 Port 10/100Mbps Fast Ethernet Unmanaged Switch (F0915) **$335**

DES-1024D 24 Port 10/100Mbps Fast Ethernet Unmanaged Switch (G1783) **$417**

DES-1016R+ 16 Port 10/100Mbps Fast Ethernet Unmanaged Switch Optional Module (DES-102F) (D4164) **$525**

DES-1024R+ 24 Port 10/100Mbps Fast Ethernet Unmanaged Switch Optional Module (DES-102F) (E3669) **$667**

Gigabit Switch Solutions

NEW

DGS-1008T 8 Port Gigabit Copper Ethernet Switch Rent* $19.89/wk(D9338) **$1,775**

DGS-1024T 24 Port Gigabit Copper Ethernet Switch Rent* $46.12/wk(G1968) **$4,998**

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Networking Solutions

AirPlus 22Mbps - *Industry's First 22Mbps Wireless LAN*

DI-614+
AirPlus 22Mbps Wireless DSL/Cable Router with 4 Port Switch.



New 22Mbps Wireless

SPECIAL PRICING

Rent* $6.49/wk

(G0229) **$579**

DWL-650+
AirPlus 22Mbps Wireless LAN PCMCIA Card.



SPECIAL PRICING

(F5422) **$149**

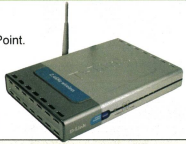
DWL-520+
AirPlus22Mbps Wireless LAN PCI Adapter.



SPECIAL PRICING

(F5421) **$185**

DWL-900AP+
AirPlus 22Mbps Wireless LAN Access Point.



SPECIAL PRICING

(F5423) **$309**

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Ask About... EXTENDED HARRIS WARRANTY

Indoor/Outdoor Wireless Bridge/Antennas

DWL-1500
11Mbps Wireless Indoor Bridge.



Rent* $7.27/wk (D9147) **$649**

DWL-1800B
11Mbps Wireless Outdoor Bridge Base Unit.

Rent* $34.09/wk (F7810) **$3,435**

DWL-1800R
11Mbps Wireless Outdoor Bridge Remote Unit.

Rent* $28.73/wk (F7812) **$2,895**



ANT24-1801
Outdoor 18dBi Directional Yagi Antenna.



(F0067) **$485**

ANT24-0801
Indoor/Outdoor 8.5dBi Antenna.



(F4220) **$249**

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

Air Pro, 54Mbps Wireless LAN

DWL-A520
54Mbps Wireless PCI Adaptor.



(F4222) **$495**

DWL-A650
54Mbps Wireless PCMCIA Card.



(F4224) **$455**

DWL-5000AP
54Mbps Wireless Access Point.



Rent* $11.53/wk (F4225) **$1,029**

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Belkin - KVM Switches

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*Delivery charges extra.

Belkin PDA

F8E717
LCD Screen Overlays - Compaq iPAQ
(E0216) **$24**

F8Q1002
Travel Kit
for iPAQ H3100, H3600, H3700 Series
(F9651)* **$79**

F8Q1000
USB Sync Charger
(D5952) **$37**
for iPAQ H3700 Series & below.

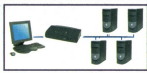
F8Q1401
Leather Flip Case - iPAQ
(E1520) **$34**

F8Q1402
Slim Leather Case - iPAQ
(E1521) **$34**

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Over One Million Belkin KVM units sold World wide!

CONNECT MULTIPLE COMPUTERS USING BELKIN KVM SWITCHES



F1DB102P	Economy 2 Port KVM Switch - PS/ 2	(D3162)	**$84**
F1DB104P	Economy 4 Port KVM Switch - PS/ 2	(D3159)	**$175**
F1DS102P	SOHO 2 Port KVM Switch - PS/ 2	(D3163)	**$289**
F1DS104P	SOHO 4 Port KVM Switch - PS/ 2	(D3166)	**$369**
F1DS102T	SOHO 2 Port KVM Switch - PS/ 2 & USB	(D3165)	**$299**
F1DS104T	SOHO 4 Port KVM Switch - P/S 2 & USB	(D3167)	**$385**

OMNIVIEW PRO2 SERIES 4, 8 OR 16 PORT KVM SWITCH WITH ON SCREEN DISPLAY

F1DA104Tz	Pro 2 4-Port KVM Switch - PS/ 2 & USB	(E5376)	**$495**
F1DA108Tz	Pro 2 8-Port KVM Switch - PS/ 2 & USB	Rent* $8.23/wk (E5377)	**$735**
F1DA116Tz	Pro 2 16-Port KVM Switch - PS/ 2 & USB	Rent* $11.18/wk (E5378)	**$998**
F1DM216Tz	Matrix 2 x 16 Port KVM Switch - PS/ 2 & USB	Rent* $15.22/wk (E5380)	**$1,358**

Don't forget to include your Belkin All-In-One cables



The easiest & neatest way to connect all your computers and servers to your PS/2 & USB KVM switches, providing image clarity for high-resolution applications.

Belkin Surge Protectors

Belkin offers a complete Surge Protection range, for the average home to a total office solution. All Belkin Surge Protectors are guaranteed to protect against over-voltages, catastrophic surges and lightning strikes.
We also offer the best no hassles connected equipment warranty in the business. We will repair or replace any damaged connected equipment.



F5C208z2-TEL3

Belkin's Maximum Grade Surge Protectors
Connected Equipment Warranty up to $80,000
Belkin's Maximum Grade Surge Protectors are the ideal solution for protecting high-end computers, servers, multi-media set-ups, critical office equipment including high volume copiers and faxes. They are also perfect for protecting your home theatre and other sensitive electronic equipment.
(C4607) **$135**



F5C206z2-TEL3

Superior Grade Surge Protectors
Connected Equipment Warranty up to $50,000
Belkin's Superior Grade Surge Protectors, are the ideal solution for protecting mid level computers/office workstations, small office copiers and faxes. They are also perfect for protecting your TV, video/DVD & stereo and other electronic equipment.
(C4604) **$98**



B5CAU007

Belkin's Home Office Grade
Connected Equipment Warranty up to $25,000
Belkin's Home Office Grade Surge Protectors are the ideal solution for protecting entry level computers, cordless phone, bubble jet printers, personal copiers and all other home office electronic equipment.

Purchase the Belkin B5CAU007 and receive a free single outlet surge cube F5C195z worth $25



(F4128) **$49**

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Belkin Networking Solutions

WIRED ETHERNET NETWORK



Up to 3 Additional PC's

F5D5000
Desktop Network PCI Card
(C5581) **$25**
Desktop Not included



Internet

Phone Line

Cable Line

Cable/DSL Modem

F5D5130z5
5 Port Network Switch 10/100
(D4192) **$129**



F5D5230z4
4 Port Cable/DSL Gateway Router
(D5943) **$249**



Notebook or CardBus Network Card
F5D5020
10/100Mbps PCMCIA NIC - 16 Bit
(C5583) **$89**
and F5D5010
10/100Mbps CardBus NIC - 32 Bit
(C5582) **$99**
Notebook Not included

OR



F5D6230z3
Wireless Router (3 Port)
Rent* $6.49/wk
(D8219) **$579**

WIRELESS NETWORK



Desktop
Desktop Not included

F5D6050z
USB Wireless Adapter
(D8216)
$189



Wireless Desktop Network Card
F5D6001z
PCI Adapter
(G1691) **$213**
Desktop Not included

NEW



F5D6130z
Wireless Network Access Point
(D8217) **$469**



Laptop

Wireless Notebook Network- F5D6020z
Wireless PCMCIA (D8213) **$169**
Notebook Not included



F5D6060au
Wireless CF Network Card
(F0910) **$209**
PDA Not included

CAT5 Network Cable
USB Cable
Cable Line
Phone Line
Wireless Link

Cables are not inluded in prices

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F8Q1503



SnapNTYPE keyboard for iPAQ 3800 (F3219)
$74

F8Q2300



Stylus Pen for iPAQ 3800 (F9847)
$15

F8E708



Stylus Pen Belkin 4-in-1 Stylus Pen. (C4694)
$35

USB 2.0 Products - 40 X Faster than USB 1.1



F5U217z
HIGH SPEED USB 2.0 3 PORT POCKET HUB.
(G1692) **$94**



F5U220
HIGH SPEED USB 2.0 5 PORT PCI CARD.
(C7546) **$96**

USB 2.0 Upgrade Kit



F5U900au

F5U222au

- Instantly upgrade your computer to the ultrafast speed of USB 2.0.
- Include Belkin cable.
- Tranfer Up to 480Mbps.
- USB 2.0 is ideal for transferring extremely large amounts of data such as real-time video cameras, scanners, portable drives and others.
- Compatible USB 1.1 spec devices.

F5U900au
Upgrade Kit (F0897) **$135**

F5U222au
PCMCIA (F0898) **$135**

F5U148



Belkin USB 8-in-1 Media Reader/Writer
(F9649)
$99

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Essential Accessories for Mobile Computing

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Four Great Ways to carry your Notebook from Targus

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Camera Cases

DADM15 (F7091) **$15**

DADS15 (F7101) **$13**

DCRCO1 (F7120) **$12**

DCUCO1 (F7130) **$15**

RAKGear Slam Silver



RGS012

Includes: A padded notebook compartment that fits 15" screens, 2 side accessory pockets, nylon webbing zipper pulls, internal cushioned mobile phone pocket, oversized file compartment and slip pocket, accessory webbing loops on shoulder straps, contoured shoulder straps with 3-D air mesh, inner-pocket organisers and flat compartments, double-buckle wrap design for attaching extra gear, cushioned pocket for CD player with headphone porthole, key clip. Other colours available.

(F3511) **$79**

Sportline Standard Backpack



The Sportline Backpack appeals to today's mobile professionals with an active lifestyle. Constructed of heavy-duty fabrics with nylon webbing reinforcement. This backpack contains a padded computer compartment to protect your notebook, multiple compartments for your files and accessories and padded shoulder straps for superior comfort. Other features include a mobile phone pouch, moulded carrying handle and a cushioned mesh back.

Platinum/Black (F0752) **$85**

Blue/Black (D6300) **$85**

Sports Backpack



Olive CZ1001

The Sports Backpack combines ergonomic design with functionality for the mobile road warrior. Safely protecting your notebook with a padded compartment and an additional removable air cushion for extra protection, the Sports Backpack also provides multiple compartments for your files and accessories including CD & MP3 players, disks, cables and PC cards. Stylish & lightweight, it's many features include a mobile phone pouch, ergonomic padded shoulder straps and a file section.

(C9860) **$119**

Air Top Loading Universal Case



The Targus Top Loading Universal Case is an enhanced version of our best selling Universal Notebook Case. Key features include the convenient top-loading design, lightweight construction, APS and a shock absorbing shoulder strap. The printer/accessory section will carry all popular portable printers, full size binders/day planners or computer accessories. The popular zip-down work station includes pockets for a phone, PDA, zip disks, PC cards & pens.

(91341) **$139**

FUJI XEROX

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Solid ink makes brilliant colour affordable for every user

Ask About...

EXTENDED WARRANTY HARRIS TECHNOLOGY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

Xerox Phaser 8200 Series Colour Printers



Phaser 8200B
Image for illustration purposes only

Outstanding Value
- Extremely low entry point at $3,895
- Low cost per page
- Free one-year on-site warranty, toll-free telephone support, online customer support

Exceptional Performance
- Brilliant colour on any media type
- Improved image processing with 300 MHz RISC processor
- 16 ppm fast color mode, 10 ppm standard mode with first page out time of 9 seconds

Unrivaled Simplicity
- No-mistake loading with Phaser 8200 ink shapes
- Simple to set up, easy network installation
- Minimal number of moving parts and consumables = more reliability and less waste

Phaser 8200B • 4 configurations available
Rent* $36.85/wk (F3977) **$3,895**

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Essential Accessories for Mobile Computing

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Defcon CL
2m of cut-resistant galvanised steel cable lock & 10,000 user-settable combinations to keep your valuable notebook secure.
(81511) **$67**



Defcon Authenticator
Use the latest fingerprint technology to keep your information secure and make passwords obsolete.
(E5313) **$259**



Retractable Phone Cord
6m of telephone cord in a compact case that alleviates carrying loose cables for connecting to telephone jacks while on the road.
An inexpensive alternative to bulky telephone cables.
(F0746) **$24**



USB Notebook Light
Small, sleek, silver light plugs into your USB port to provide Xenon™ illumination anywhere. Enough light to illuminate the keyboard
(F9325) **$16**

Sportline Backpack
Don't stand out to laptop thieves! No-one will know you are carrying a notebook in this stylish backpack. A padded computer compartment protects your notebook, with ample room for files & accessories, while you are on the go!
(F0754) **$119**



Trademark Rolling Case
Give your back a rest with this convenient rolling case. Features include in-line skate wheels and a 5 stage telescopic handle.
(E3497) **$153**





"What can I use with my notebook to be more mobile & efficient?"

Ultra-Mini 4 Port USB Hub
Small & attractive, this hub can fit any place on a desktop, allowing for easy connection of four low speed or full speed USB devices to your USB enabled computer. Glows Blue!
(F0749) **$42**



Nokia Phone Charger
Includes a USB charge cable and a 9V-to-USB battery to easily charge your Nokia phone on the road
(G1596) **$27**



Wireless Optical Mini Mouse
Navigate a mouse without messy cables from up to 1m away from your notebook or desktop.
(F3343) **$95**



PDA Combo Kits



CHKIT1 - IPAQ (F0735) **$27**
CHKIT2 - Jornada/Tosh (F0736) **$27**
CHKIT3 - Palm M500/505. (F0737) **$27**

PDA In-Vehicle Charger



CHVC01 - IPAQ 38xx (F0738) **$19**
CHVC03 - Palm M500 & 505 (F0739) **$19**
CHVC02 - Jornada (F0743) **$19**
CHVC04 - IPAQ 36xx Tosh e570. (F0745) **$19**

PDA USB Charge Sync Cables



PA265U - Palm M500 (E4164) **$38**
PA285J - Jornada (F9292) **$38**
PA290J - IPAQ 3600 (E0378) **$38**
PA295J - IPAQ 3800 (F9333) **$33**

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Peripherals and Accessories

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Digital Memory Readers



CompactFlash (F0861) **$38**
MemoryStick (F0864) **$38**
Secure Digital/MultiMediaCard (F0863) **$38**
SmartMedia (F0862) **$38**

USB Connectivity, Portable Compact Design, Hot swappable.

Multi Card Reader (F5533) **$88**



Digital Memory Cards



CompactFlash

32MB CompactFlash	(B2921)	$49
64MB CompactFlash	(B2922)	$78
128MB CompactFlash	(B2923)	$135
256MB CompactFlash	(C0777)	$253
512MB CompactFlash	(E1225)	$517

SmartMedia

16MB SmartMedia	(B2915)	$26
32MB SmartMedia	(B2916)	$39
64MB SmartMedia	(B2917)	$69
128MB SmartMedia	(C3680)	$139

SecureDigital Cards

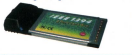
16MB SecureDigital	(D4115)	$49
32MB SecureDigital	(D4116)	$84
64MB SecureDigital	(D4117)	$123
128MB SecureDigital	(D5918)	$249

MultiMedia Cards

32MB MultiMediaCard	(B9873)	$49
64MB MultiMediaCard	(B9878)	$106
128MB MultiMediaCard	(F7833)	$229

Expansion Cards

FIREWIRE AND USB For Laptops



Cardbus FireWire Card (B9849) **$88**



USB 2.0 Cardbus Card (E6328) **$99**

For Desktops



PCI FireWire Card (90689) **$49**



PCI FireWire USB 2.0 Combo Card (E5013) **$153**



PCI USB 2.0 Card (F2992) **$49**

I/O CARDS

IDE Ultra DMA 133 Raid Card (E7377) **$85**



Ultra-SCSI Card (90681) **$69**



Serial Cards, Parallel Cards, USB Hubs and FireWire Hubs also available.

Pocket PC Accessories

CompactFlash Modem



(83607) **$235**

CompactFlash LAN Card



(F0767) **$239**

CompactFlash GPS Card



(E5015) **$475**

Compact Camera



NEW (F0865) **$249**

Compact Bluetooth



NEW (F0866) **$259**

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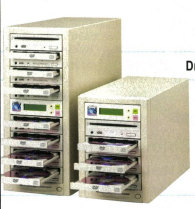
Prices are subject to change. Check here for latest prices & products!!
Web Direct www.ht.com.au/cat/verbatim

CD/DVD Duplicators and Publishers

Verbatim CopySmart CD and DVD Copiers

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

No PC required
Single button copy
All drives burn simultaneously



Drives	40x CD-R		Drives	2x DVD-R	
1	Rent* $13.77/wk (F3430)	$1,229	3	Rent* $41.58/wk (F7628)	$4,395
3	Rent* $21.73/wk (F1867)	$1,939	5	Rent* $60.88/wk (F7629)	$6,597
7	Rent* $36.66/wk (F1349)	$3,875	7	Rent* $78.26/wk (F7630)	$8,793

PRIMERA TECHNOLOGY, INC.

Bravo Burn and Print

Introducing the World's First Fully Integrated CD-R Burning and Printing Device.

- 2400 dpi Printing
- 40x CD-R drive
- Windows 2000/XP Software
- Fully integrated robotics
- 25 disc capacity for unattended burning and printing

NEW



Rent* $41.11/wk (G1708) **40x CD-R $4,346**

Rent* $50.15/wk (G1709) **2x DVD-R $5,435**

Desktop Publishers

RIMAGE™

Choose 1, 2 or 4 40x CD-R or 2x/8x DVD-R drives

SPECIAL PROMO PRICING
for 2 and 4 drive models
Valid from 1st September to 30th November, 2002
See web direct link below for more details
Web Direct www.ht.com.au/cat/verbatim



2 Drives pictured

Desktop 800 CD-R 40x, 60 Disc

- Network burning software included with unlimited user site license
- Integrated inkjet printer
- 50 – 110 disc capacity
- Fully automated disc production
- Comes with software, firewire card and cables

Single Drive Rent* $76.26/wk (F7882) **$9,095**



4 Drives pictured

PRIMERA TECHNOLOGY, INC.

Signature IV CD Printer



- 1200x1200dpi res
- Fast: 27 seconds per disc.

Rent* $29.72/wk (B9917)
$2,995

Signature Pro CD Printer



- 2400dpi
- Superfast
- Dual Ink cartridges

Rent* $37.60/wk (C3681)
$3,789

Inscripta Printer

Special Price



- 610 x 305dpi thermal
- Durable finish

Rent* $46.25/wk (B2932)
$4,889

See page 32 for Printable Discs for these printers

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Sales: 1300 13 9999 Web: www.ht.com.au
Fax: 1300 13 6666 Email: sales@ht.com.au

HARRIS TECHNOLOGY. Technology Centre at Kmart Broadway-Sydney

Verbatim

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Web Direct www.ht.com.au/cat/verbatim

CD and DVD Media: Storage for Life

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery. HARRIS TECHNOLOGY. *Delivery charges apply.

Verbatim DVD Media

DVD-R



4.7GB DVD-R for general data - singles

(C8840) **$9**

Printable surface discs also available

DVD-RW



4.7GB DVD-RW (version 1.1) – singles

(C8841) **$12**

DVD+R



NEW

4.7GB DVD+R - singles in video box

(F9427) **$11**

Jewel case also available

DVD+RW



4.7GB DVD+RW – singles

(D9166) **$12**

DataLifePlus CD-R - 48x



NEW

80min. 700MB 1x - 48x 10 Pack

(G1680) **$11**

MusicLifePlus CD-R Audio



80min. 10 Pack

(C7889) **$13**

80min. Singles

(D0011) **$2**

Printable CD-R Media



In spindles of 50 inkjet printable 80min 48x.

(G1742) **$43**

Silver thermal printable 80min 48x.

(D0562) **$46**

See page 31 for CD Printers

DataLife CD-R

NEW

- Third generation Phthalocyanine Recording Dye Technology.
- Scratch resistant surface.



80min. DataLife SlimCase 10 pack multispeed

(F8563) **$9**



80min. DataLife spindle 30 pack multispeed

(F9171) **$18**

Digital Vinyl CD-R



NEW

Designed to look like a vinyl record these eye-catching discs are a great way to save delicate LP collections or make a standout business presentation.

80min Vinyl CD-R 10 pack

(G1731) **$12**

Pocket Colours 8cm CD-R



Mini CD's that fit in your pocket!

Store up to 3 hours of MP3's or up to 185MB of pictures, files or any data you like. Compatible with any standard tray based CD player or burner.

21Min, 185MB 1x -16x 5 Pack

(D9192) **$8**

21Min, 185MB 1x-16x 10 Pack

(C9459) **$15**

DataLifePlus Colours CD-R



80 Min. 700MB coloured CD-R's in a 25 pack 48x

(G2024) **$27**

80 Min. 700MB coloured CD-R's in a 10 pack 48x

(G2015) **$11**

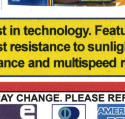
DataLifePlus CD-RW

700MB CD Rewritable 2x - 4x 5 pack colours

(D9230) **$8**

650MB 2x - 4x singles

(77492) **$2**



NEW

700MB 16x -24x singles

(G1741) **$2**

650MB 4x -12x singles

(F3941) **$2**

Did you know...

Verbatim DataLifePlus CD's represent the latest in technology. Featuring a proprietary blue Super-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

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Web Direct www.ht.com.au/cat/lacie

Best Storage Solutions

d2 EXTERNAL HARD DISK

LaCie d2 range is a professional flexible system. Made of extruded aluminium, material used in Formula 1 for its robust and lightweight as well as cooling very quickly. Kensington cable lock and power lock for better security. Front power button and blue activity led, switches on/off with your computer. Supplied with drivers for mac and PC. Drives can be used stacked horizontally or can be mounted in a 1U 19" rack (kit sold separetely).



Stackable



80GB	7200rpm	FireWire		(G1744)	$485
120GB	7200rpm	FireWire	Rent* $7.25/wk	(F7923)	$647
80GB	7200rpm	USB2.0		(G1817)	$485
120GB	7200rpm	USB2.0	Rent* $7.25/wk	(G1281)	$647

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery. HARRIS TECHNOLOGY. *Delivery charges extra.



LaCie Floppy USB (F8125) $113

d2 EXTERNAL CDR/DVDR

LaCie CDR/ DVDR come complete with all software in the new d2 casing, all cables and first media. Silent and efficient, they are the best professional burners on the market at the most affordable price.



DVDR/RW/CDRWA04 USB2.0 & FireWire

Rent* $12.20/wk (G0456) $1,089

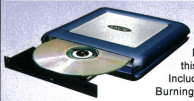
CDRW 48/12/48 FireWire (G1821) $498

Pocket CD-Recorders

LaCie Fusion CDRW is made of sleek aluminium. Includes EZ CD creator for PC.



CDRW Fusion 24/12/40 USB2.0 (F7291) $349



LaCie Pocket CDRW is made of aluminium and moulded silicon bumpers to protect this slim unit. Includes EZ CD creator Burning software.

CDRW 24/10/24 USB2.0 & FireWire (G1908) $574

d2 external AIT tapes

LaCie d2 tape drives Include 1st cartridge, cables and Retrospect desktop v5 software.



AIT-1 (35GB) USB2.0 & FireWire

Rent* $23.97/wk (G1075) $2,135

AIT-2 (50GB) Ultra2LVD

Rent* $35.92/wk (G1904) $3,619

AIT-3 (100GB) Ultra160

Rent* $77.29/wk (G1906) $8,684

Pocket Hard Disk

LaCie Pocket hard disks are the most robust and mobile drives on the market. Made of light aluminium for better cooling and fully moulded in a silicon bumper for better protection of the drive. Includes USB2.0 and bus powered Firewire interface, complementary power supply and drivers.



20GB USB2.0 & FireWire (F5369) $517

40GB USB2.0 & FireWire Rent* $7.38/wk (F5371) $659

60GB USB2.0 & FireWire Rent* $13.64/wk (F5372) $1,217



LaCie 6-in-1 Card reader (F8285) $135

Ask About... EXTENDED HARRIS WARRANTY

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Sales: 1300 13 9999 Fax: 1300 13 6666 Web: www.ht.com.au Email: sales@ht.com.au

See Page 2 for Locations

Quantum

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Web Direct www.ht.com.au/cat/quantum

Quantum – Data Storage

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

SuperLoader

- DLT1 - 640GB capacity @ 3MB/sec transfer rate
- SDLT - 1.76TB capacity @ 11MB/sec transfer rate (above are native figures. 2:1 compression is achievable)
- Choice of drives for value or performance
- Huge performance/capacity upgrade path
- Single cartridge mail slot allows removal of cartridges without system interruption
- Web based management tools allows control and monitoring from remote location
- Optional barcode reader for non-sequential tape management
- 1 million MCBF



DLT1 Rent* $100.07/wk (F1234) **$12,345**

SDLT Rent* $170.52/wk (F1235) **$21,195**

Ask About... EXTENDED HARRIS TECHNOLOGY WARRANTY

The new Quantum SuperLoader™ quickly stores up to 3.5TB in only 2U. It also features up to 16 DLTtape™ cartridges, sophisticated on board remote management tools and convenient ways to import and export cartridges. For more information, visit www.quantum.com/superloader

MONSTROUS CAPACITY
Tiny Footprint

RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

The Broadest Line-up of Network Attached Storage

Guardian 4400

NEW PRODUCT



•640GB & 480GB of Network Attached Storage (NAS). •High density 1U format fits standard 19" racks or easily stacks on tabletops. •RAID 5, 1, 0 •Automatically recognises and supports all major network platforms. •100base-TX/ 10Base-T Ethernet connectivity •SNMP support for centralised management - can also be managed remotely via web browser. •Front, hot swappable disk drives. •Dual Gigabit Ethernet. •Very low total cost of ownership.

480GB Rent* $86.07/wk (G1518) **$10,265**

640GB Rent* $99.26/wk G1517) **$12,245**

Snap Server 12000



•960GB of Network Attached Storage (NAS) •Less than a 15-minute installation •Compact 3U rack-mountable form factor •Hot-swappable drives •Dual redundant hot-swappable power supplies and cooling fans •RAID 5, 1, 0 •Automatically recognises and supports all major network platforms •Gigabit/ 100Base-TX/10Base-T Ethernet connectivity •SNMP support for centralised management •Very low total cost of ownership.

960GB (C9169) **$33,635**

Snap Server 1100



•80GB or 40GB of Network Attached Storage (NAS) •Five minute installation •Compact, portable easily fits in a briefcase, on a shelf or on a tabletop •Automatically recognises and supports all major network platforms •100Base-TX/10Base-T Ethernet connectivity •SNMP support for centralised management - can also be managed remotely via Web browser •Very low total cost of ownership.

40GB Rent* $15.30/wk (E4199) **$1,365**

80GB Rent* $23.97/wk (E4200) **$2,139**

Snap Server 2200



•160GB of Network Attached Storage (NAS) •Five minute installation •Compact, stand alone unit easily fits on a shelf or tabletop •RAID 1, 0 •Automatically recognises and supports all major network platforms •100Base-TX/ 10Base-T Ethernet connectivity •SNMP support for centralised management- can also be managed remotely via a Web browser •Very low total cost of ownership •Network UPS support.

160GB Rent* $35.22/wk (D1208) **$3,549**



HARRIS TECHNOLOGY. for all your computer needs!

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Maxtor®

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Make Movies at Home - Easy!



Maxtor

Maxtor DV Producer™ is one of the easiest ways to turn your home videos into Hollywood-style movies. Regardless of your skill level, the flexible, easy-to-use software will let your creativity soar with artistic templates, realistic special effects, professional transitions and titling, and multiple audio tracks. Everything you need is included in this kit: A. Maxtor FireWire™ (1394/i.LINK®) card, B. Camcorder cable, C. ArcSoft™ ShowBiz™ video editing software. Make spectacular movies in three easy steps:

Making Movies Like a Professional!

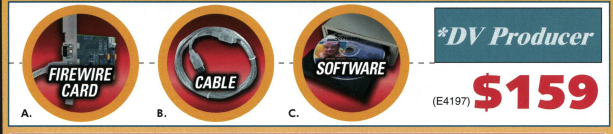
Designed for beginners and advanced users. Windows® Compatible

FEATURES:
- Easy editing software
- Add special effects
- Easy installation
- Complete kit

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery. HARRIS TECHNOLOGY. *Delivery charges extra.

Wine on-line? VINTAGE CELLARS vintagecellars.com.au

Now you're making movies like a professional!



*DV Producer

(E4197) **$159**

Fast Delivery Australia-Wide

Maxtor Personal Storage

FireWire



Maxtor Personal Storage 3000DV/80GB
Ideal for speed-intensive applications such as editing digital video, playing games, and listening to music. The 3000DV features the Maxtor award-wining 7200 RPM hard drive–up to 56% faster than 5400RPM external hard drives.

Rent* $7.71/wk

80GB (E4068) **$688**

FireWire



Maxtor Personal Storage 3000XT/160GB
With the highest capacity maxtor offers, this is the perfect external storage solution for today's storage-hungry digital entertainment equipment. Run applications, edit videos, listen to music, download files, or play games, or store all your important documents and precious memories.

Rent* $10.07/wk

160GB (E4067) **899**

USB 2



Maxtor Personal Storage 3000LE/40GB/120GB
Instantly add storage for your digital photos, videos, MP3 songs, games, and important electronic files. The USB 2.0 interface is up to 40 times faster than USB 1.1. The 3000LE is compatible with virtually all existing USB ports–offering connectivity for today's systems and speed for tomorrow's technology.

40GB (E4064) **$399**

Rent* $7.83/wk 120GB (E4065) **$699**

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Sales: 1300 13 9999 **Web: www.ht.com.au**
Fax: 1300 13 6666 **Email: sales@ht.com.au**

Order on-line www.ht.com.au

Pioneer

Prices are subject to change. Check here for latest prices & products!!
Web Direct www.ht.com.au/cat/pioneer

Multimedia: DVD & Blank Media

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery*
HARRIS TECHNOLOGY
*Delivery charges extra.

Pioneer

DVR-A05

DVD-R/RW Writer
CD-R/RW Writer

Now even faster!
DVD-R: 4x DVD-RW: 2x



FEATURES:

DVD R/RW

Writes:

DVD-R	(4x)
DVD-RW	(2x)
CD-R	(16x)
CD-RW	(8x)

Incorporates Blue Genesis DVD Engine

Reads:
DVD-ROM & DVD-Video, DVD-R, DVD-RW, CD-ROM, CD-Extra, Video CD, Photo-CD, CD-Text, CD-R, CD-RW.

INCLUDES COMPREHENSIVE SOFTWARE PACKAGE

- DVD Workshop SE — DVD Authoring Package
- VideoStudio 6.0 SE — Video Editing Suite
- DVD PictureShow SE — Burn your still images onto DVD
- Veritas RecordNow DX — High performance CD or DVD recording
- DLA & Simple Backup — Write data files to CD or DVD
- PowerDVD XP — For DVD movie playback
- DVD Authoring example CD, how to use DVD Workshop
- 1 x DVD-R media
- 1 x DVD-RW media

ULEAD CREATIVE INTELLIGENCE

·Smart laser drive technology
Pioneer's advanced laser drive uses a pickup that incorporates a write strategy control circuit, ensuring a stable writing performance at high speeds.

·Liquid crystal tilt technology
Previous models used a mechanical tilt mechanism. The DVR-A05 features a liquid crystal tilt mechanism This provides more accurate, reliable operation with discs having uneven curvature or thickness. This superior mechanism is used for both playback and recording.

·Internationally recognised reliability and compatibility
The DVR-A05 writes and reads DVD-R/RW, write once/re-recordable formats that can be played on most DVD video players and DVD-ROM drives. Both DVD-R and DVD-RW are approved formats by the DVD Forum.

DVR-A05 (G2070) **$699**

Pioneer DVD-R MEDIA


DVS-R47BF 4x DVD-R General media with slim jewel case
(G2072) **$10**


DVS-RP47BF 4x DVD-R Thermal / Inkjet printable with slim jewel case
(G2073) **$12**


DVS-R47BP5F 4x DVD-R 5 Pack with slim jewel case
(G2074) **$45**

DVD-RW MEDIA


DVS-RW47CF 2x DVD-RW with slim jewel case
(G2075) **$15**

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Web Direct www.ht.com.au/cat/iomega

Smart Storage Solutions

Zip 750MB USB



With more speed, and more capacity, the NEW Iomega® Zip® 750MB drive and disk is the fast and durable, portable storage solution to back up your important data. Iomega Automatic Backup software makes backup a snap, and Iomega Sync software helps transfer files between computers. Zip 750MB drives and disks are the smart data storage choice.

(Z9601) **$418**

External Hard Disk Drive



Iomega External Hard Drive adds secure storage easily and quickly.
It comes complete with Iomega Sync™ and Automatic BackUp™ disaster recovery software to protect your files.

NEW!

80GB Rent* $7.68/wk (F9625) **$686**

120GB Rent* $9.48/wk (F9789) **$846**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery*.
HARRIS TECHNOLOGY.
*Delivery charges extra.

Zip 100 USB Powered



An affordable total storage solution as easy to use, but far superior to, the floppy drive. Iomega's Zip® 100MB USB-Powered drive is affordable, reliable, easy to use and has a sleek, durable design powered through the USB cable for complete plug-and-play compatibility.

(D0587) **$165**

Portable Hard Disk Drive



Iomega portable HDD drive is a complete solution that makes security, recovery and data storage easy. QuikSync™ automatic back-up and disaster recovery software protects your files. Built in a durable, slim design that's easy to take with you.

USB2 Card sold separately

20GB (E7321) **$436**

40GB Rent* $7.45/wk (F9794) **$665**

iomega

NEW!

Zip 750MB 2 pack disk (F9779) **$59**

Zip 750MB 10 pack disk (F9780) **$298**

Zip 100MB disk (23772) **$19**

10-pack: (21889) **$189**

Zip drive carry case (31823) **$49**

Zip disk 250MB (74454) **$29**

Zip disk 250MB 10 Pack (74452) **$249**

NAS Servers

Choose Iomega for easy-to-install and manage network storage solutions that allow multi-platform file sharing and data consolidation. Hot-swappable drives and RAID 5 data protection, Iomega NAS servers deliver enterprise class data access and reliability for small business budgets. Plus, you choose the capacity, OS, level of performance and data reliability – so you get the optimum data storage and backup solution.



160GB Unix-based Rent* $48.38/wk (F9749) **$5,243**

320GB Unix-based Rent* $66.38/wk (F9751) **$7,458**

480GB Unix-based Rent* $76.59/wk (F9829) **$9,135**

160GB Microsoft-based Rent* $60.52/wk (F9756) **$6,799**

320GB Microsoft-based Rent* $75.11/wk (F9769) **$8,958**

480GB Microsoft-based Rent* $92.05/wk (F9830) **$10,978**

Predator

NEW Speed



The Iomega Predator 40x12x40 External USB 2.0 CD-RW drive boasts the highest speeds on the market along with the coolest design available. It includes all the hardware and industry-leading software you need to easily and very quickly burn CDs. This drive comes with Iomega HotBurn CD mastering software: MusicMatch™ Jukebox and Adobe® ActiveShare™.

(G2006) **$429**

Host Powered 250 USB



NEW – Host-powered Zip® 250MB USB drive. Now it's even easier to take your information with you. The Zip® 250 USB drive is now available with a USB cable that provides both data and power, so you don't need any external power source. Its easy to connect (just plug it in) and easy to launch (no rebooting)! This new drive is compatible with most major operating systems and all Zip® 100MB and 250MB Zip® disks.

(B6404) **$319**

CASIO®

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Web Direct www.ht.com.au/cat/casio

Wearable Card Camera

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery. HARRIS TECHNOLOGY. *Delivery charges extra.



Casio EXS2 Exilim 2.0MP

The Movie Mode can be used to record movies, each of which can be up to 30 seconds long. Clear, realistic images let you capture all of the action of sports and other fast paced events.

HOT NEW PRODUCT

Image Size:	1600 x 1200, 1280 x 960 & 640 x 480
Recording:	Stills (JPEG), movie (AVI)
Memory	12MB internal
Pixels:	2.0 million pixels effective CCD
Monitor:	1.6" TFT Colour LCD
Communication:	USB connection/ cradle
Power:	Rechargeable lithium ion battery
Size:	W: 88mm x H: 55mm x D: 11.3mm
Weight approx:	88g excluding battery



DON'T FORGET your Fly Buys points!

Casio EXS2 Exilim (G1941)

$693

Rent* $7.76/wk



Casio EXM2 Exilim Wearable Card Camera & MP3 Player
(Head phones and remote controller included in EXM2 model) (G1944) **$793**
Rent* $8.88/wk

Nikon COOLPIX

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Web Direct www.ht.com.au/cat/nikon

Extraordinary Digital

Coolpix Cameras

RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

Coolpix 4300

The latest 4MP from Nikon.
- 4-Megapixel
- 3 x Optical Zoom, 4cm close up macro
- 12 'Scene' modes
- Movies
- One button transfer
- Re-chargeable Li-ion battery and charger.



Rent* $12.30/wk (G1815) **$1,098**

Coolpix 4500

- High resolution 4-megapixel CCD
- 4x optical zoom with digital zoom up to 4x • 2cm macro close up • 16 scene modes • Voice memo function • 5-Area multi-autofocus • Panorama assist feature helps stitching panoramas • Small picture feature for emails • Perspective control helps to 'straighten' converging lines • One button transfer of images. • Re-chargeable Li-ion battery and charger.



Rent* $16.80/wk (F4003) **$1,499**

Coolpix 2000

- 2-megapixel CCD
- 3 x optical zoom with digital zoom up to 2.5x • 5 Scene Modes with easy mode dial •Movie mode • Easy upload transfer button •Small pic feature for email • AA batteries.



Rent* $6.36/wk (F4002) **$568**

Coolpix 2500

- Pocket sized • Style with a twist
- 2-megapixels • 3x optical zoom and up to 4x digital zoom • 12 Scene modes • Small picture mode for easy emails • One button transfer • Quick review function.
- Re-chargeable Li-ion battery and charger.



Rent* $7.67/wk (E5781) **$685**

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Kodak

RENTSMART
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Share Moments. Share Life™



Kodak LS420

Simple. Little. Fun.

Introducing a nifty little camera that fits anywhere, goes anyplace, and does just about anything.

- 2.1MP for beautiful prints.
- Kodak colour science technology.
- Introduces new night shot flash mode.
- On-camera print button, video with audio capabilities.
- Part of the EasyShare System.
- Movie mode, audio recording during capture.

Rent* $7.22/wk (E7255)

$645

Not af... in sto... stores b... ordered for ... up or Deliver

HARRIS TECHNOLOGY.

*Delivery charges extra.

Kodak DX4900

The first print-optimised Camera.



•4.0MP point & shoot digital camera designed to be one touch simple •New 3x Advanced Digital Zoom •3 sharpness models (sharp, standard, soft) •High speed sequence shooting up to 3FPS (burst) •Flash modes, auto, fill, red-eye, off •ISO settings auto 100 - 400 or selectable 100, 200, 400 •White balance modes Auto, Daylight, Tungsten, Fluorescent •Shutter speed controls auto 1/2000 sec to 16 seconds.

Rent* $10.00/wk (E3471) **$893**

Kodak DX3215

Making digital easy– one picture at a time.



Great pictures made easy! Want to get into digital with ease? You've found your camera. •This camera gets you started with 1.3MP resolution for great prints up to 5" x 7" • A 4x zoom (2x optical and 2x digital) lets you get closer to the fun •It's the perfect camera to get you into digital picture-taking •One touch picture transfer •8MB internal memory.

(C9539) **$389**

Kodak DX4330

EasyShare Zoom digital camera.



• 3.1MP for prints up to 28cm x 36cm (11in. x 14in.).• Kodak Retinar, aspheric, all-glass lens with autofocus. • 10x zoom (3x optical, 3.3x advanced digital). • New share button on camera. • Kodak colour science inside. • 16MB internal memory and MMC/SD card expansion. • Compatible with optional Kodak EasyShare camera dock.

Rent* $9.85/wk (F9806) **$879**

Kodak LS443

NEW

Introducing the Kodak EasyShare LS443 zoom digital camera.



From prints up to 50 cm x 76 cm to its professional-quality lens, this camera will both impress and inspire.

Rent* $13.39/wk (G1816) **$1,195**

Kodak CX4200

Get ready to shoot – and share.



Kodak EasyShare CX4200 digital camera, great picture quality. •2.0MP resolution •Prints up to 8" x 10" (20cm x 25cm) premium Kodak Retinar •All-glass lens •2x digital zoom •16MB internal memory expandable MMC/SD memory card slot •Auto picture rotation on camera, PC or TV.

(F9631) **$394**

Kodak CX4230

EasyShare Zoom digital camera.



•2.0MP for prints up to 20cm x 25cm (8in. x 10in.) •Kodak Retinar, aspheric, all-glass lens with autofocus •6x zoom (3x optical, 2x digital) •New share button on camera •Kodak colour science inside •16MB internal memory and MMC/SD card expansion •Compatible with optional Kodak EasyShare camera dock.

Rent* $6.49/wk (F9796) **$579**

Kodak PICTURE CARDS

32MB Picture Card (62677) **$57**

64MB Picture Card (82249) **$89**

128MB Picture Card (A5253) **$159**

Kodak QUALITY PAPERS

Ultra Glossy 15 sheets (B1656) **$14**

Satin 15 sheets (D3251) **$14**

Satin 75 sheets (D3258) **$35**

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High-Breed Monitors

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SyncMaster 753DFX 17" CRT Monitor



SOHO Series Features:

- 16" viewable screen
- 0.20mm dot pitch (horizontal)
- 1280 x 1024 max resolution @ 66Hz
- DynaFlat - Infinitely flat tube
- Smart III surface treatment (Anti-static & anti-glare)
- On screen digital display
- Plug & play compatibility
- MPR-II/NUTEK certified

(C1283) **$325**

SyncMaster 955DF 19" CRT Monitor



Graphix Pro Series Features:

- 18" viewable screen
- 0.20mm dot pitch (horizontal)
- 1600 x 1200 max resolution @ 68Hz
- DynaFlat - Infinitely flat tube
- Onscreen digital display
- Smart III surface treatment (Anti-static & anti-glare)
- MPR-II/NUTEK certified
- Plug & play capability

(C3975) **$549**

SyncMaster 151S 15" LCD Monitor



- *Optional Pivot to Portrait- head of monitor can be turned.*
- 15" viewable screen
- 1024 x 768 max resolution @ 76Hz
- Colours 16.2M
- H.Frequency 30 ~ 61 kHz
- V.Frequency 50 ~ 75 Hz
- Contrast 330:1
- Luminance 250cd/m2
- Viewing angle140°/120°
- Input connectors 15pin D-Sub
- Sync type composite H/V, SOG
- Power 30W (max.)

Black Rent* $9.51/wk (D4036) **$849**

SyncMaster 171N 17" LCD Monitor



- 17" TFT computer monitor
- 1280 x 1024 max resolution
- 16.2 million colours
- 140/120 viewing angle (H / V)
- 350:1 contrast ratio
- **Ultra slim bezel (13.5mm)**

Silver Rent* $16.57 /wk (F9638) **$1,479**

NEW

SyncMaster 181T 18" LCD Monitor



The SyncMaster 181T is the ideal display for all business and professional applications. Its new slim design refined with Samsung's digital technology allows the product to fit all working environments. The SyncMaster 181T is power efficient as well. It consumes less than 1 Watt of power in power off mode, and its built-in power adaptor frees you from a dangling power brick, leaving your desk clean and simple. DVI-D/ Analogue and DVI-D cable is included in box. brightness 500:1.

• Medically certified • **Ultra slim bezel (18.6mm).**

Silver Rent* $23.81/wk (F8249) **$2,399** **Black** Rent* $23.81 /wk (E7318) **$2,399**

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EXTENDED HARRIS WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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Value for money & leading technology



CML152XW 2
15" TFT LCD Monitor
XGA 1024 x 768 @ 75Hz
Rent* $9.13/wk
(F4105)
$815



CML153XW
15" TFT LCD Monitor
with Speakers - XGA
1024 x 768 @ 75Hz
Rent* $10.34/wk
(D5744)
$923



CML181SXW
18" TFT LCD Monitor
1280x1024@85Hz
RGB + DVI Inputs
Rent* $21.98/wk
(D7709)
$2,215



CML170SXW PLUS
17" TFT LCD Monitor
1280x1024@85Hz
RGB + DVI Inputs
Rent* $16.69/wk
(F8885)
$1,489



CML174SXW
17" TFT LCD Monitor
1280x1024@60Hz
RGB + DVI Inputs
Rent* $15.56/wk
Ivory (G2012)
Black (G2014)
$1,389



CML200UXW B
20" TFT LCD Monitor
1600x1200@60Hz
RGB + DVI Inputs
Rent* $35.20 /wk
(F8911) **$3,547**



CM715
19" General Purpose
CRT Monitor
1600x1200@75Hz
0.22mm Horizontal Dot Pitch
Rent* $6.23/wk
(97803)
$556



CM621
17" Flat CRT Monitor
1024x768@85Hz
0.22mm Horizontal Dot Pitch
(C9156)
$385



CM721
19" Flat CRT Monitor
1600x1200@75Hz
0.20mm Horizontal Dot Pitch
Rent* $7.77/wk
(C8839)
$694



CM827
21" CRT Monitor
1856x1392@72Hz
0.21mm Horizontal Dot Pitch
Rent* $17.00/wk
(F1129)
$1,517

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Microsoft hardware

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FLY BUYS 200 BONUS POINTS

Collect 200 Bonus Fly Buys points when you purchase F9311, F9312 or F9313 between 20/10/02 - 30/11/02



Optical Mouse Blue

The Mouse that Brightens your Desktop

Turn any desktop into a bright, vibrant, space. Microsoft Optical Mouse Blue includes a wider, clear scroll wheel, with a signature red optical glow, all in a fun design. Roll and scroll in style!

Benefits:

- Unique Clear Scroll Wheel
- Fun Optical Glow – No mouse ball!
- Comfort for Either Hand
- Dazzling Design

(F9311) **$55**



Wireless Optical Mouse Blue

Brighten Your Desktop with Wireless Freedom

Turn your desktop into a vibrant, clutter-free space with Microsoft Wireless Optical Mouse Blue. Wireless technology, a wider, clear scroll wheel, and signature red optical glow combine in a fun design. Roll and scroll in style and freedom!

Benefits:

- No Cord, No Clutter
- Unique Clear Scroll Wheel
- Fun Optical Glow – No mouse ball!
- Comfort for Either Hand
- Dazzling Design

(F9312) **$129**

Multimedia Keyboard

The Multimedia Keyboard That Fits Your Digital Lifestyle

Now there's a keyboard that maximizes your digital experience! One-touch buttons take you directly to your favorite multimedia activities—navigate music and video clips, surf the Web, start the programs you use most, and more. With easy-to-use keys and custom blue accents, the Microsoft MultiMedia Keyboard adds dynamic features and vibrant looks to any desktop.



Benefits:

- Convenient Media Center
- Enhanced Function Keys
- Vibrant Design

(F9313) **$74**

MS Internet Keyboard

Easy One-Touch Access to the Internet, E-mail, and more

The Microsoft® Internet Keyboard gives you one-touch access to e-mail, the Web, and the programs you use most. The familiar, durable keyboard design, customizable Hot Keys, and Control key Shortcut labels help you work more efficiently



Benefits:

- Get fast and easy one-touch access to the Web, e-mail, and your favorite applications
- Customizable Hot Keys for quick access to your favourite programs and Web sites • Durable, familiar keyboard design •Detachable palm rest

(F9189) **$49**

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Winfast TV2000 XP Deluxe TV Tuner

Microsoft Windows XP Support Image/Video Capture Remote Control.

(E6710) **$145**



Geforce 4 A170 TH NVIDIA MX420 GPU

64MB SDR Memory
TV out support
Hardware Monitoring.

(E6721) **$217**



Geforce 4 A170 TH NVIDIA MX440 GPU

64MB DDR Memory
TV out support
Hardware Monitoring.

(E4900) **$225**



*Geforce 4 A250 LE TD My Vivo Edition Ti 4200

64mb DDR memory
TV Out and DVI support
Video In functionality

(F7644) **$415**



*Geforce 4 A250 TD My Vivo Edition Ti 4400

128MB DDR memory
TV Out and DVI support
Video In functionality

(F3186) **$558**



*Geforce 4 A250 Ultra TD My Vivo Edition Ti 4600

128MB DDR memory
TV out and DVI support
Video in functionality.
Twin Turbo cooling

(F7642) **$789**

*Video capture software included

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Video Editing Hardware

PCTV



(80290) **$125**

Watch TV on your PC!
The Pinnacle PCTV allows you to watch and record TV on your PC. You can record into MPEG-1 or MPEG-2 (depending on system speed) and then burn to DVD or CD. The PCTV features scheduled recording, video capture, time-shifting for pausing or replaying a live show WITHOUT AFFECTING THE RECORDING, plus lots more!
** PCTV Pro includes an FM radio tuner as well as stereo sound.

PCTV Pro



(F0462) **$238**

Studio DVClip

NEW!



The best starting point for DV editing. Looking for an easy, affordable way to edit your DV or Digital 8 movies? Look no further! Studio DVClip comes with a special version of Pinnacle's award winning new Studio software and because it's so stable and easy to use, it's the number one choice for beginners. Includes IEEE1394 (FireWire) card, IEEE 1394 cable, and Studio 7 SE software.

(G1772) **$162**

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STUDIO 8 Software

NEW!



Pinnacle SmartCapture automatically detects where each scene starts & stops and logs them in your album ready for you to drag & drop into your project. Capture your videos directly as DVD quality MPEG-2 files & can capture from Sony's new MicroMV camcorders. Only Pinnacle Studio 8 supports both formats. Edit MPEG-1 & MPEG-2 file formats. Studio 8 now incorporates CD & DVD authoring directly from the timeline. For CD & DVD authoring - allows you to add motion backgrounds, menus & animated buttons. Fully integrated Title DEKO for professional titling. Works with any OHCI compliant IEEE1394 card.
"COMPLETE EDITING AND DVD CREATION PACKAGE".

(F9327) **$253**

STUDIO 8 IS INCLUDED IN THESE GREAT PACKAGES

STUDIO DV

NEW!



Studio DV - complete & affordable all-digital solution.
Includes 3 (two external, one internal) port IEEE1394 (FireWire) card & full version of Studio 8.
"COMPLETE EDITING AND DVD CREATION PACKAGE".

(F9326) **$347**

STUDIO DV PLUS

NEW!



Studio DV Plus - flexible output options (digital or analogue).
No need to record through your camcorder to VHS tape. Includes IEEE 1394 (FireWire) card with S-Video and Composite video (analogue) outputs and full version of Studio 8.
"COMPLETE EDITING AND DVD CREATION PACKAGE".

(F9328) **$495**

STUDIO DC10 Plus

NEW!



Studio DC10 Plus - dedicated solution for capturing & exporting your videos to analogue tapes (VHS, SVHS, Hi8 tapes, TV & Webcams).
Includes analoge capture and output card and full version of Studio 8.
"COMPLETE EDITING AND DVD CREATION PACKAGE".

(F9329) **$489**

STUDIO DELUXE

NEW!



Studio Deluxe - Covert analogue to DV format, & other way around.
Full analogue & DV editing solution! Dedicated breakout box for desktop connections. Includes Analogue and Digital capture card, full version of Studio 8 and Hollywood FX Plus. This is the ultimate home video solution.
"COMPLETE EDITING AND DVD CREATION PACKAGE".

(F9330) **$847**

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Video & Multimedia Tools

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DVRaptor RT Bundle
Includes RaptorRT, ADVC-50 & Adobe Premier 6.5!(Analogue & DV in/out)
(F7695)
$1,465

JD-1 USB jog shuttle controller (C5578) $375
ADVC-50 DV Converter (F1170) $489
ADVC-100 DV Converter (D4514) $699



DVStorm2
Realtime Production Studio

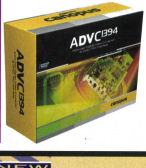
NEW PRODUCT

DVStorm2 delivers the industry's highest-quality DV and MPEG, breakthrough realtime performance and a professional, stable studio environment.

- On board MPEG encoder for lightning fast MPEG encoding.
- MPEG tools for capture, cutting and re-encoding.
- Includes Ulead's DVD Workshop SE.
- Additional filters for StormEdit and Adobe Premiere. (Adobe Premiere optional).
- 3D Picture in Picture controls.
- "One-pass" scene capture utility.

(G1647) $2,199RRP

The World's First OHCI Card with Native DV & Analog Video Capture



ADVC-1394 is a one stop Plug & Play solution providing analog and DV capture with a powerful content creation software bundle.

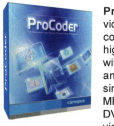
(F4092) $599



EZDV-Fast, friendly, easy-to-use DV capture and editing using high quality Canopus technology.

(F0859) $449

The Ultimate Format Converter



ProCoder facilitates video format conversion delivering high-quality output without the long wait and guesswork of similar tools. Supports MPEG 1/2, Canopus DV, Microsoft DV, any video for Windows codec, Quicktime, NTSC to PAL.

(E7320) $1,499

NEW MAGIC

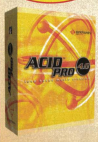
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Multimedia Tools

*Site Licenses available on all Sonic Foundry Products

Hauppauge TV GO (89063) $155
Hauppauge TV GO FM (89064) $197
Bonus free remote control with GoFM

NEW PRODUCT



ACID PRO® 4.0
Powerful, Loop-Based Music Creation

ACID PRO® 4* is here! Featuring 5.1 surround mixing, advanced MIDI editing, plug-in effects automation and much more! The best loops editing package just got a whole lot better - and for a limited time it ships with Sound Forge Studio 6 and Classic 8packs loop library free!

ACID PRO 4.0

(F9372) $439

TV Tuner Card & Video Recorder

Hauppauge!

PVR allows you to watch/record live TV onto your hard drive in DVD quality (MPEG2)



Hauppauge PVR USB (D1776) $549

Hauppauge PVR PCI (B2593) $589

VideoFactory 2* allows you to capture and edit digital video on your PC. It's perfect for home movies, web videos, music videos, weddings, corporate presentations and much, much more. It's packed with 115 effect presets and 170 customisable transition presets apply in real-time or customise your own! Supports OHCI DV cards.



(D1566) $219



TV USBFM Radio (98455) $309

WATCH TV ON YOUR NOTEBOOK
The Hauppauge TV USB and TV USB FM allow you to watch TV on your notebook using its USB interface. The compact external unit also accepts video from a VCR or camera. Basic capturing functionality is also provided.

TV USB (89066) $25

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hp LaserJet & Business InkJet Printers

hp LaserJet 3300 & 3330mfp

Full featured multi function printer
•Up to 14 ppm (A4 size) •compact size to save office space •The HP Ultra Precise print cartridges print more than 2,500 pages each •Optional high - capacity cartridge print up to 3,500 pages •Duty cycle of 10,000 pages-per-month •One- year warranty •Digital copying 14cpm 600 x 600dpi •Flatbed scanner scans up to 216 x 381, 600ppi colour •90MHz mm •32MB RAM.



hp LaserJet 3300
digital print-copy-scan Rent* $12.72/wk (E3828) **$1,135**

hp LaserJet 3330mfp
print-fax-copy-scan Rent* $17.31/wk (E3864) **$1,545**

hp Color LaserJet 2500 Series

A personal A4 colour at an affordable price
•16ppm black, 4ppm colour •Half the cost of a CLJ4600 •Very quiet when operating •125 sheet MP tray & 250 sheet cassette •125 sheet face down output (250 & 500 paper trays available) •Straight -thru paper slot for thick media •Simplified controls panel (buttons and lights) •ImageRE 2400 •64MB RAM (all configurations) expandable 320MB.

NEW



hp LaserJet 2500
(Lite Version) Rent* $23.39/wk (G0177) **$2,357**
hp LaserJet 2500
(Base Unit) Rent* $28.21/wk (F8656) **$2,843**
hp LaserJet 2500n
(Networked) Rent* $33.38/wk (F9812) **$3,364**

hp LaserJet 2200 Series

hp LaserJet 2200 series
Is a range of entry-level workgroup laser printers that deliver reliable and professional laser print quality at 18ppm with resolution up to 1200 x 1200 dpi at full speed. Adaptable and versatile, the hp LaserJet 2200 series has multiple connectivity options, 3 DIMM slots and versatile paper-handling capabilities.



hp LaserJet 2200 Rent* $16.53/wk (D0869) **$1,475**
hp LaserJet 2200d
Rent* $17.22/wk (B9956) **$1,537**
hp LaserJet 2200dn
Rent* $22.92/wk (B9957) **$2,045**
hp LaserJet 2200dtn
Rent* $26.09/wk (B9898) **$2,629**

hp Color LaserJet 4600 Series

High-speed A4 colour at an affordable
•Up to 16 ppm monochrome and colour •inline technology allows outstanding prints speed and quality • 600 dpi with imageRE 2400 •Enhanced ease of use •400MHz processor •100-sheet input tray •96MB printer memory •1 year onsite warranty •85,000 pages per month duty cycle.



hp LaserJet 4600 96MB RAM
Rent* $43.26/wk (E7298) **$4,573**
hp LaserJet 4600dn 96MB RAM, auto-duplexing
Rent* $49.73/wk (E7299) **$5,389**
hp LaserJet 4600dtn 160MB RAM, auto-duplex, additional 500 sheet feeder tray Rent* $63.16/wk (E7300) **$7,096**

hp LaserJet 4100 Series

hp LaserJet 4100 series workgroup printers deliver the highest value in their class, with more speed, more capacity and new 'intelligent' e-enabled printer management features. Replacing the hp LaserJet 4050 series, hp LaserJet 4100 series come with enhanced performance and industry-leading reliability.



hp LaserJet 4100 Rent* $21.28/wk (B8399) **$1,899**
hp LaserJet 4100n Rent* $25.29/wk (B8400) **$2,549**
hp LaserJet 4100tn Rent* $29.26/wk (B8401) **$2,949**
hp LaserJet 4100dtn
Rent* $34.33/wk (B8402) **$3,459**

hp Business InkJet 2600 Series

•Up to 15ppm monochrome & up to 11ppm colour •Up to 1200 × 600 dpi •hp photoret 3 technology delivers true-to-life colours •Modular ink delivery system: four printheads/ cartridges •Up to 400 sheet input capacity •Ink level indicator; job cancel button; LCD display •1 year standard warranty •12,000 pages per month •2600dn model comes with network ready and automatic duplexer.



hp InkJet 2600 48MB RAM
Rent* $22.28/wk (E3874) **$2,245**
hp InkJet 2600dn 48MB RAM,Network, Duplexing
Rent* $30.65/wk (E3875) **$3,089**

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hp LaserJet 1000- USB



Rent*$6.71/wk (C9361)
$599

hp LaserJet 1200 Series



1200
Rent*$8.79/wk (B9799)
$785
1220 scan/copy
Rent*$10.36/wk (B9968)
$925
1200n-16MB
Rent*$14.51/wk (B9958)
$1,295

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hp deskjets, officejet & multifunction printers

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hp deskjet 3420



•HP PhotoREt 3 colour layering technology - more colour shades for incredibly realistic images •up to 2400 x 1200dpi colour printing on photo papers •print longer lasting photos with specially formulated hp fade-resistant inks and photo papers •prints up to 10ppm in black and 8ppm in colour •on-screen ink level indicator •on-screen print cancel lets you stop unwanted print jobs at a click •USB.

(F7708) **$145**

hp deskjet 3820



•Photo-quality with HP PhotoREt 3 colour layering technology •up to 4800 optimised dpi in colour (on hp colourfast photo paper & 1200 x 1200 input dpi) and rich black text •specially formulated hp fade-resistant inks and photo papers •one-touch print cancel button •low-ink indicator light •prints up to 12ppm in black and 10ppm in colour •networkable with optional hp jetdirect wired and wireless print servers.

(F7709) **$194**

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02 9774 8666

hp deskjet 5550



•Get best photo-quality with HP PhotoREt 3 colour layering technology •up to 4800 optimised dpi in colour (on hp colourfast photo paper & 1200 x 1200 input dpi) and rich black text •optional 6-ink colour printing with HP PhotoREt 4 colour layering technology •prints up to 17ppm in black and 12ppm in colour •networkable with optional hp jetdirect wired and wireless print servers •borderless 4" x 6" photo printing on hp colourfast photo paper •ink backup printing mode •automatic paper- type sensor.

(F7710) **$287**

hp officejet V40

All-In-One Scanner/ Printer/ Fax/ Copier



•8ppm •600dpi black text •Up to 7ppm and 2400dpi color printing on premium photo papers •36bit color scanning with 600 x 1200 •Plain paper black and color fax with 14.4k modem •60 speed dials for fast transmission •20 page automatic document feeder •Colour fax and copy at a touch of the button - without being connected to a PC •Included OCR software keeps you from having to retype hardcopy text documents.

(D7688) **$469**

Ask About...

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

hp PSC 750

Print/ Scan/ Copy



• Speed: Black - 11ppm, Color - 8.5ppm * • Resolution: Black - 600dpi; Color - PhotoREt 3 (2400 x 1200dpi using photo paper) • Printer Memory: 4MB ROM & 8MB of Synchronous DRAM • Language: HP PCL Level 3 • Scan Resolution: 600 x 2400dpi optical (up to 9600 dpi enhanced) • Scan Quality: 8-bit greyscale (256 levels of grey) & 36-bit colour • Copy Speed: Black: 11 copies per minute Color: 8 copies per minute.

* Print speed may vary dependant on system configuration and document complexity

(C7655) **$364**

hp D145

Colour All-In-One with high-speed printing/copying



•Print up to 2400 x 1200dpi on HP Premium Photo Papers •Print photos directly from your digital camera's memory card (CompactFlash, SmartMedia, Sony Memory Stick) with HP's Photo Proof Sheet Technology - with or without a PC •Get fast printing at up to 19ppm in black, up to 16.8ppm in colour •Copies up to 18 sheets per minute in black, and up to 16 in colour •Fast colour faxing with a 33.6Kbps modem, one-touch key pads, speed dials and other fax functions.

Rent* $12.65/wk (E7707) **$1,129**

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hp scanjets & consumables

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery. HARRIS TECHNOLOGY. *Delivery charges extra.

hp scanjet 2300C

Easy one touch scan and copy front panel buttons



- Up to 600dpi optical resolution
- 48bit colour
- Speedy previews in 14 secs
- 10 - 2000% scaling
- Windows 98, 2000, Me, XP
- USB 1.1 and 2.0
- CCD Scan Technology allows you to scan 3-D objects - scan a flower as easily as a magazine.

(F4233) **$155**

hp scanjet 3500C

Easy one touch scan, copy and email front panel buttons



- Up to 1200dpi optical resolution, 48bit colour
- Speedy previews in 10 seconds
- CCD Technology exceptionaly crisp and sharp scans of photo, graphics and text, as well as convenient & 3-D objects
- Includes HP Memories Disc software.

(F4235) **$239**

hp scanjet 3570C

Built in 35mm negative/slide adapter



- Easy one touch scan, copy and email front panel buttons
- Up to 1200dpi optical resolution, 48bit colour
- Speedy previews in 10 seconds
- Features HP CCD Technology exceptionaly crisp and sharp scans of photo, graphics, text, & 3-D objects
- Includes HP Memories Disc software.

(F4313) **$325**



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ink cartridges



No 29 Black Inkjet Cartridge (21919) **$69**

No 45 Black Inkjet Cartridge (22643) **$69**

No 78 Tri Colour Inkjet Cartridge Large (97335) **$139**

toner



hp c4092a LaserJet print Cartridge for HP LaserJet 1100, 3200; 2500 page toner (70459) **$129**

hp 92298a LaserJet Black Print Cartridge for LJ 4/M,4+/M+,5/N/M 6800 page Toner (07995) **$195**

hp 92298x LaserJet Black Print Cartridge for LJ 4/M/+/M+/5/5M/5N 8800 Page Toner (42504) **$209**

paper



hp c7006a hp photo quality, semi-gloss, A4, 25 sheets (C6840) **$13**

hp q1936a hp premium inkjet paper, A4, 200 sheets (D9329) **$37**

hp c7014a hp colorfast photo paper T3, A4, 20 sheets (C6528) **$53**



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MINOLTA QMS

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The future in Imaging

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Technology Centre Shoppers! Not all products are in-store, but consulting & advice available on all items.

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- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

NEW!



Magicolor 2300 DeskLaser

HOT PRICE

The InkJet Killer

A colour laser printer under $2000 without the killer inkjet running costs. Armed with high resolution, high capacity and high quality output this guy leaves nothing but a small footprint and carries a tiny cost of ownership.

Rent* $22.36/wk (F7927) **$1,995**

Print Speed	**Up to 4 ppm colour A4, 16 ppm mono**
Resolution	**2400 x 600 dpi**
Interface	**Ethernet (10/100BaseTX); USB 1.1; Parrallel optional Bluetooth**
Compatibility	**Windows 95/98/2000/NT/XP**

NEW!



PagePro1200W

Desktop Monochrome Printing

To break away from the pack and take the lead, you need office equipment that enables you to do more with fewer resources. With a 3 year exchange warranty that includes the drum, the PagePro 1200W has amazing printing efficiency.

Rent* $6.69/wk (F9324) **$597**

Print Speed	**Up to 12 ppm**
Resolution	**1200 x 1200 dpi**
Interface	**USB 1.1; IEEE 1284 parallel**
Compatibility	**Windows 95/98/2000/NT/XP**



PagePro 9100N

Networkable A4 & A3 monochrome laser printer

The PagePro 9100N represents the best value in A3 network printing! Even with print speeds of 35 pages per minute and free Ethernet interface, its price matches what you'd expect to pay for smaller, slower laser printers.

Rent* $36.89/wk (E3659) **$3,899**

Print Speed	**35 ppm A4, 19 ppm A3, mono**
Resolution	**1200 x 1200 dpi**
Interface	**10/100BaseTX Ethernet**
Compatibility	**PostScript 3, PCL 6, PDF, HP-GL, PCL 5e**



Magicolor 3100

16ppm A4 tandem colour laser printer

Finally there's a desktop colour laser printer for business that prints just as fast in colour as it does in black and white. The magicolor® 3100 delivers up to 16 pages per minute to get the job done. It also has automatic duplexing for two-sided printing.

Rent* $48.40/wk (D9169) **$5,245**

Print Speed	**16 ppm colour & mono**
Resolution	**1200 x 1200 dpi**
Interface	**NETWORK READY, 10BaseT/100 Base TX Ethernet, Parallel**
Compatibility	**PostScript 3, PCL6, PDF, HP-GL**

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The Power to Create

PRINTER

NEW

EPSON STYLUS PHOTO 830

•6-colour ink system •Up to 14ppm black text printing A4 economy •5760 optimised dpi using RPM technology for true photo quality •MicroPiezo print head technology •Incredible fine 4 picolitre ink droplets •True BorderFree printing •USB and parallel interface •Over 25 years lightfastness.



(G2192) **$365**

COLOUR LASER PRINTER

NEW

EPSON ALC4000

•Up to 16ppm in full-colour! •Less than 30 seconds warm up time •True 1200dpi, with AcuLaser 2400dpi Class RIT •192MB, expandable to 1.024MB •Networking and Duplexing Standard •Large paper capacity with versatile paper handling •Advanced Job Management including Confidential Job printing (requires optional hard drive).



Rent* $49.34/wk (F3409) **$5,347**

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PRINTER

EPSON STYLUS C61

•Crisp text, vibrant colours coupled with speed and reliability •Up to 14ppm black text A4 (memo) printing •5760 x 720 Optimised dpi using RPM technology •USB and Parallel enabled.



(F8180) **$229**

PRINTER

EPSON STYLUS C41UX

•Up to 12ppm black text printing (at economy mode) •Up to 1440dpi photo quality printing resolution •USB-enabled and complete with cable •Intelligent Ink System •Fast, easy set-up and operation.



(F0853) **$119**

Web Direct

See Web Direct Link (at top of page) for all your Epson ink & paper needs!

PRINTER

EPSON STYLUS PHOTO 2100

•Up to 2880 x 1440 dpi •7 colour individual ink system with a new light black and either photo or matte black •A3+ •Epson Intellidge ink system •True BorderFree printing •Roll paper printer and auto cutter •75yrs lightfastness •Up to 1.3mm thick media support.



Rent* $20.68/wk (F2969) **$1,845**

PRINTER

EPSON STYLUS PHOTO 1290

•A3+ •6 colour photo printing •Border-free edge to edge printing •Max res 2880 x 720dpi with variable sized droplet technology •Over 20 years lightfast prints •Features print image matching technology •On demand inkjet (piezoelectric) •Black text 9.4ppm (economy) •Text & photo 3.0ppm (normal) •Full page colour 1.3ppm (normal).



Rent* $11.14/wk (C2150) **$995**

COLOUR LASER PRINTER

EPSON ALC1000

High quality, affordable A4 colour laser printer. Ideal for small business or home office environments. Up to 20ppm mono, 5ppm in full colour, EPSON 2400 RIT, 80MB memory, low running costs and easy to maintain. Proprietary EPSON imaging technologies ensure superior output with clear, sharp text and high-contrast, colour-accurate images.



Rent* $25.43/wk (E3772) **$2,563**

COLOUR LASER PRINTER

EPSON ALC2000

Workgroup colour laser printer that delivers professional quality output. Up to 20ppm mono, 5ppm in full colour, Epson 2400 RIT, 32MB memory, integrated network adapter, Proprietary Epson imaging technologies ensure superior output with clear, sharp text and high-contrast, colour-accurate images. Adobe Postscipt Option available!



Rent* $37.79/wk (A7365) **$3,995**

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MONO LASER PRINTER

EPSON EPL-5900

•12ppm •True 1200dpi Resolution •200MHz RISC Processor •USB & IEEE1284 Parallel Interface •8MB Memory – Expandable up to 136MB •Standard 250 Sheet Multi Purpose Tray & Optional 500-Sheet Lower Paper Cassette Unit.



Rent* $7.49/wk (E5160) **$669**

MONO LASER PRINTER

EPSON EPL-5900L

The class leading desktop laser printer. Fast durable and high quality for the value conscious home and small office •Superior print quality •Fast 12ppm •1200dpi class resolution.



(E5318) **$495**

SCANNER

EPSON EXPRESSION 1640XL



The Expression 1640XL A3+ scanner features EPSON's most advanced scanning technologies providing high speed, maximum detail and superior sharpness and clarity.

Rent* $49.78/wk (B1330) **$5,395**

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Canon

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Canon Digital Cameras.....

CanonPowerShot A200 2 MegaPixel



•Fixed-focal length, auto focus, 5mm f2.8 lens •PC/TV display •Up to 30sec movie recording •USB plug and play •Auto loading software for trouble free transfering, printing & image storage.

(F4062) **$375**

Canon PowerShot A30 1.2 MegaPixel



•Canon 3x optical zoom lens •Built-in flah • USB interface •LCD monitor, TFT colour •Shutter speed: 15-1/1500 sec.

(E3967) **$489**

Canon PowerShot A40 2.0 MegaPixel



•Movie recording and playback with audio •Five photo effect modes •3x optical zoom lens, 7.5x with digital zoom •Built-in flash •USB interface •LCD monitor, TFT colour.

Rent* $7.61/wk(E3969) **$679**

Canon PowerShot IXUS-V2 2.0 MegaPixel



•Weighs only 180g •CCD records 1600 x 1200 pixels, in large file mode •Movie recording up to 30 sec •2x optical zoom, combined with 2.5x digital zoom to give a total of 5x digital zoom •Photo effect modes •Built-in flash with 5 flashing modes. •Selectable evaluative and spot metering and AF-assist beam.

Rent* $8.79/wk (E5360) **$785**

Canon PowerShot IXUS-330 1.9 MegaPixel



•CCD records 1600 x 1200 pixels to capture even the finest details •Movie recording with audio up to 30sec •3x optical zoom, combined with 2.5x digital zoom to give a total of 7.5x digital zoom •Auto focus •Built-in flash •LCD 1.5".

Rent* $11.15/wk(E5361) **$995**

Canon PowerShot S30 3.2 MegaPixel / S40 4.0 MegaPixel



•3.2x digital zoom •Built-in flash •USB interface •LCD monitor, TFT colour •Shutter speed: 15-1/1500 sec.

S40/4.0M Rent* $15.41/wk (D5937) **$1,375**

S30/3.2M Rent* $13.20/wk (D5915) **$1,178**

Canon PowerShot G2 4 MegaPixel



•Image Sensor •Digital zoom: approx. 3.6x (maximum 11x digital zoom when combined with optical zoom) •LCD monitor, TFT colour.

Rent* $18.59/wk Black (E4320) **$1,659**

Rent* $18.59/wk Silver (D0782) **$1,659**

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

Canon Scanners.....

N640Pex Flatbed Scanner



- **Optical resolution of 600 x 1200dpi.**
- 42-bit input.
- Only 4cm tall.
- Parallel interface.
- Scans up to A4 size (quiet operation).
- Complete software package, LiDE Technology.

(D4026) **$127**

LiDE20 Flatbed Scanner



- **One touch scan, copy and email.**
- USB interface.
- 600 x 1200 dpi.
- 48-bit input.
- 24-bit output.

(F9858) **$165**

N1240U Flatbed Scanner



- **Amazing 1200 x 2400dpi optical with selectable resolution up to 9600dpi.**
- Stylish charcoal and aluminium finish.
- New Z-lid for scanning thick books etc.
- Software included: OmniPage and PhotoShop Elements.

(C7589) **$228**

D1250U2 /D1250U2F Flatbed Scanner



- **High Speed At the Right Price.**
- 1200 x 2400 dpi optical resolution.
- USB 2.0 for faster scanning.
- Easy one touch control.
- Software included: Photo Studio 2000 and Omnipage Pro 9.0.

(E1246) **$218**

• with 35mm Film Scanning (E1230) **$299**

D660U Flatbed Scanner



- **600 x 1200dpi optical resolution for documents.**
- 1200 x 1200dpi optical resolution for slides and film.
- Built-in 35mm slide and film scanning.
- 42-bit input colour depth.

(A8903) **$238**

CanoScan D2400UF Flatbed Scanner



- **Film and Slide Capable Scanner.**
- 2400 x 4800 dpi optical resolution.
- 48-bit colour.
- Built-in film scanner for 35mm, 120 format and 4 x 5" format.
- Wide aperture lens.
- USB interface.

Rent* $6.35/wk (B9840) **$567**

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Canon Laser Printers.....

LBP810 Laser Printer



Canon LBP-810 Laser
- 8ppm engine speed.
- High resolution 600dpi.
- Outstanding line definition with smoothing equivalent to 2400dpi horizontally.
- Great graphic & photo handling with a balance between speed & quality.
- Parallel and USB interfaces standard.

(C3917) **$439**

LBP1210 Laser Printer

Canon LBP-1210 Laser
- Super fast 14ppm laser printer.
- 600 x 600 dpi or 2400 x 600dpi with automatic image refinement.



(F8274) **$539**

Bubble Jet Printers

NEW PRODUCT

Ultimate Laser Replacement

Canon N1000 Bubble Jet

•High speed printing up to 20ppm •2400 x 1200dpi resolution • Low maintenance design •Optional network adapter •Four individual ink tanks.



N1000: A4 Rent*$17.36/wk (G1015) **$1,549**

N2000: A3 Rent*$21.84/wk (G1016) **$1,949**

Canon Inkjet Printers.....

S100SP Bubble Jet Printer



- **High speed printing, up to 5ppm black text and up to 2ppm colour.**
- USB interface for Windows®.
- Dual ink drop sizes for fine printing.
- 720 x 360dpi.

(E4209) **$105**

S200SP Bubble Jet Printer



- **Up to 5ppm black & white printing.**
- Up to 2880 x 720dpi print resolution.
- Colour lasts up to 25 years using Canon's photo paper pro.
- USB interface for Windows®.

(E1132) **$149**

S330 Bubble Jet Printer



- **Up to 14ppm black and white** and 10ppm colour printing.
- Full bleed photo print .
- **Up to 2400 x 1200dpi resolution.**
- USB interface for Windows®
- Colour lasts up to 25 years using Canon's photo paper pro.

(G2318) **$249RRP**

S520 Bubble Jet Printer



- **Prints up to 14ppm black and white and 9ppm colour.**
- Up to 2400 x 1200dpi print resolution.
- Colour lasts up to 25 years using Canon's photo paper pro.
- Connect to USB or parallel.
- Replace all four ink tanks individually.

(E1136) **$359**

S750 Bubble Jet Printer



- **First Bubble Jet with 20ppm.**
- 2400 x 1200dpi resolution.
- Print full bleed A4 photos.
- Four individual ink tanks.

(E1134) **$429**

S6300 Bubble Jet Printer



- Up to 17ppm black and white.
- Up to 2400 x 1200dpi print resolution.
- **Create A3 borderless photos using A3+ paper.**
- Print photos that last up to 25 years.

Rent* $9.29/wk (E1222) **$829**

S900(A4)/S9000(A3) Bubble Jet Printer



S900

S900 prints A4 Photos in approx 1min •2400 x 1200 print dpi • Six individual photo ink tanks.

Rent* $8.23/wk (E1135) **$735**

S9000 prints A3 photos in approx 2min

Rent* $11.75/wk (E1248) **$1,049**

S830D Bubble Jet Printer



Direct camera printing.
- Bubble Jet direct memory card printing.
- Up to 4ppm, A4/A5.
- 2400 x 1200dpi print resolution.

Rent* $9.80/wk (G2457) **$875**

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- ☐ Extend to a total of 5 Years Return to Base
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COREL CorelDRAW® Graphics Suite 11

CorelDRAW 11 delivers graphic design and vector animation software for print and the web. Unique interactive tools set it apart, saving you time and making the design process easier. For example, new 3-point ellipse, rectangle and curve tools let you create and position shapes in two clicks. The new convert to curves tool allows you to apply artistic effects to blocks of text.

BONUS OFFER

Includes Three Great Products:

CorelDRAW 11 Intuitive graphic design for print and the Web

Corel PHOTO-PAINT® 11 Fast, easy and powerful photo editing

Corel R.A.V.E.™ 2 Web graphics and animation.

Purchase CDGS11 Full Version and receive a BONUS* POLAR FLEECE VEST (via redemption through Corel Customer Service)

*Terms and conditions apply

FULL VERSION (F4194) **$1,125** UPGRADE (F4198) **$549**



Creative filters for image editing
- Great with Adobe® Photoshop®
- **KPT® Hyper Tiling™** - tile images into geometrical shapes & transform them through 4D space.
- **KPT® Lightning** - control every aspect of a lightning bolt & its path.
- **KPT® Scatter™** - spread particles over image.



FULL VERSION (D1534) **$225**



COREL Bryce® 5

- Create realistic 3D landscapes and animations
- New! Network Rendering saves valuable time by letting you render images on multiple computers.
- New! Light Lab - more robust control over lighting on objects and in landscapes
- New! Tree Lab ensures a more accurate depiction of real-world environments.

FULL VERSION (C5869) **$389**

UPGRADE (C9209) **$258**

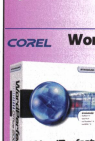


COREL Painter 7®

- Image editing and digital illustration
- Add unique painting effects to photos and designs
- Works in sync with Adobe® Photoshop®
- New Watercolor technology - see paints drip and blend together as they are applied
- New Liquid Ink layer mimics the viscosity and surface tension of a thick, gluey medium like ink or paint.

FULL VERSION (C9237) **$825**

UPGRADE (C9239) **$455**



COREL WordPerfect® Office Standard 2002

- A complete office solution which interacts with other desktop productivity suites including Microsoft Office **Includes:** •WordPerfect® 10 - word processor •Quattro® Pro 10 – spreadsheet (both read, write, edit & save in Microsoft formats) •Corel Presentations™ 10 - slide show creation •CorelCENTRAL 10 - personal information manager.

FULL VERSION (C3601) **$823**

UPGRADE (C3602) **$329**



COREL iGrafx® FlowCharter™ 2003

- Diagrams with built-in intelligence to aid in problem solving & decision making
- Publish Web Project – manages the publishing process to the Web
- New Cause & Effect fishbone diagram and improved graphical manipulation tools.

FULL VERSION (G0193) **$895**



COREL iGrafx® Process™ 2003

- Powerful graphical process modelling & simulation & comprehensive diagramming capabilities.
- Visually demonstrate bottlenecks and process behaviour
- Time-weighted Statistics •iGrafx® FlowCharter™ 2003 also included.

FULL VERSION (G0213) **$2,295**

COREL Ventura® 10

- Professional publishing solution, it helps transform long, complex files into highly formatted and visually rich publications
- New Publish to PDF
- New XML import
- Enhanced Compatibility import a wide range of file formats, including Microsoft® and Adobe® applications.

FULL VERSION (G0136) **$1,51**

UPGRADE (G0171) **$54**



COREL KnockOut 2.0

- Quickly performs complex masking and preserves fine image details such as hair, smoke, water, glass, shadows and blurred or out-of-focus edges.
- Plugs straight into Adobe® Photoshop® toolbar
- Work with images in either RGB or CMYK mode
- Perform fine corrections easily with new Brush and Eraser touch-up tools
- Undo/redo up to 99 times.

FULL VERSION (D3901) **$69**

UPGRADE (D3905) **$30**



COREL WordPerfect® Family Pack 4

- A productivity suite including word processing, spreadsheet and other desktop applications •WordPerfect® 10 - word processor, read, write, edit & save in Microsoft formats •Quattro Pro® 10 - spreadsheet read, write, edit & save in Microsoft formats •McAfee® VirusScan •Picture Publisher® Digital Camera Edition •Dragon NaturallySpeaking® Essentials •Britannica® Ready Reference™ Encyclopedia •Avery® DesignPro™

(F4199) **$18**



COREL iGrafx® Process™ 2003

- Powerful graphical process modelling & simulation & comprehensive diagramming capabilities.
- Visually demonstrate bottlenecks and process behaviour
- Time-weighted Statistics •iGrafx® FlowCharter™ 2003 also included.

FULL VERSION (G0213) **$2,29**

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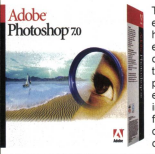
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Photoshop 7.0

The professional image editing standard!

Adobe (E4018) **$1,385**

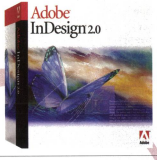


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Adobe (D1553) **$1,599**

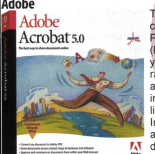


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Acrobat 5.0

The best way to share documents online!

Adobe (B9398) **$505**



This software lets you convert any document to a Portable Document Format (PDF) file. Anyone can open your PDF across a broad range of hardware - software and it will look exactly as you intended - with layout, fonts, links and images intact. Increase productivity by approving and commenting on documents within a web browser.

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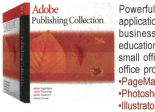


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Publishing Collection 12

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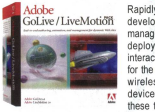


Powerful applications for business, education, and small office/ home office professionals
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- Acrobat 5.0.

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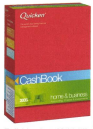
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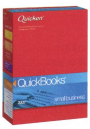


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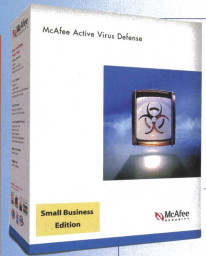
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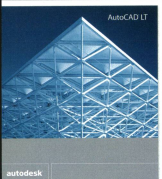
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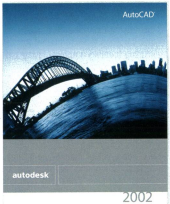
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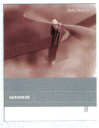
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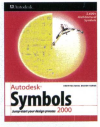
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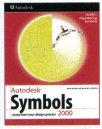
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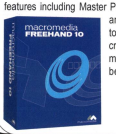
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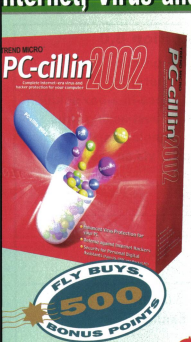
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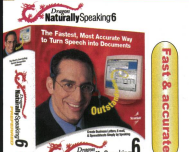
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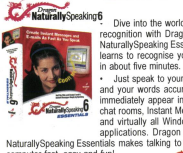
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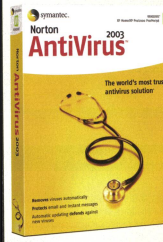
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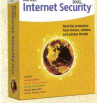
Symantec's Norton AntiVirus™ 2003 is the world's most trusted antivirus solution. Now this easy-to-use program scans and cleans instant-message attachments as well as email messages. It removes viruses automatically, without interrupting your work. And automatic updates help defend your PC against new viruses. •Automatically detects and blocks worms in outgoing email messages, stopping them from sending themselves out to others.

NEW Version

(F9859) **$93**

Norton Internet Security™ 2003 Standard

NEW Version



Symantec's Norton Internet Security™ 2003 provides essential protection from viruses, hackers and privacy threats. It includes full versions of Norton AntiVirus™ and Norton Personal™ Firewall plus other valuable protection tools.

(G0279) **$123**

Norton Personal™ Firewall 2003

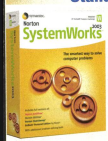
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Norton Personal™ Firewall 2003 keeps hackers out and personal data in. Secure your PC today with Norton Personal™ Firewall, your maximum defence against hackers and privacy threats.

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Norton SystemWorks™ 2003 Standard



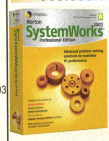
NEW Version

includes:
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•Norton Utilities™
•Norton CleanSweep™

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Symantec's Norton SystemWorks™ 2003 is the smartest way to solve computer problems. It includes award-winning Symantec products and additional utilities to keep your PC running at its best.

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•Norton CleanSweep™
•Norton Ghost™ 2003

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Norton Winfax Pro V10.02

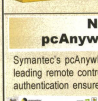
WinFaxPro Version 10.02 easily integrates with key business applications to simplify management of client and customer interactions. Send or Forward Faxes via Email, Enhance Image Quality of Outgoing Faxes Easily, Add A Signature to Outgoing Faxes, Drag and Drop Faxing.



(D6011) **$119**

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Symantec's pcAnywhere™ is the world's leading remote control software. Encryption and authentication ensure secure access to remote computers. pcAnywhere also works with cable & DSL modems for faster remote connections.

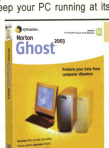


(D8088) **$239**

Norton pcAnywhere™ V10.5 / 5 User

(D5935) **$479**

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FileMaker Server is the best way to deploy your FileMaker Pro 5, 5.5 and 6 solutions. Running on Windows, and Red Hat® Linux, it features an easy-to-use relational database server supporting up to 250 concurrent guests and 125 hosted files. It includes centralised backups, remote administration, LDAP directory support, and automatic updates of plug-ins for guests.



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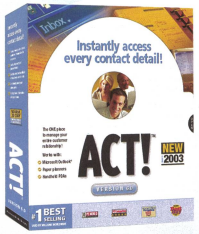
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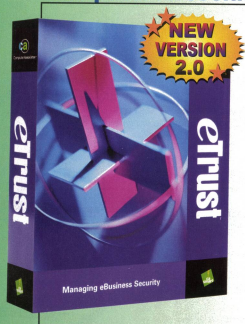
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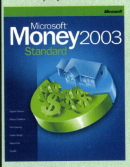
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Microsoft Home Productivity

NEW!

Microsoft® Money 2003

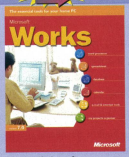


Microsoft® Money 2003 Standard provides a quick easy way to organise and manage your personal finances. Create a budget, reduce debt, balance your checkbook, pay bills and manage your home finances. Microsoft Money is personal finance made simple. Save time organising and managing finances, achieve future finance goals and make smarter financial decisions.

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(F8718) **$179**

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Outlook 2002	✓	✓	✓	✓	✓
PowerPoint 2002	✓	✓	✓	✓	
Access 2002		✓	✓	✓	
Publisher 2002					✓
FrontPage 2002			✓		
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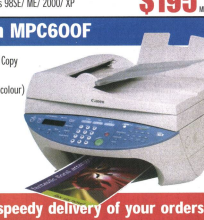
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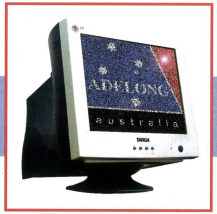
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*Upgrade pricing available only with complete Power Advantage Systems advertised on this page

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- 64mb Geforce 2 MX 400
- ASUS A7M Dual CPU Board
- 52x CD-ROM
- 1.44MB Floppy
- Intel 10/100 Pro Pci
- ATX Midi Server Case 400W
- MS Internet KB+Mouse
- 17" Monitor



Dual AMD Athlon MP 2000+™ Processor
$2400 SYADE294

+



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17" Monitor

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Intel Pentium™ 4 2.0Ghz
$1595 SYADE332

AMD Athlon™ XP 2200
$1599 SYADE330

Intel Pentium™ 4 2.4Ghz
$1655 SYADE333



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- Intel Celeron 1.2GHz
- 14.1" XGA (1024 x 768)
- 128MB PC2100 DDR SDRAM
- 16Mb UMA Cyber ALADIN-TTM
- Internal DVD drive, 3.5" FDD
- 20GB Hard drive
- SD Slot, PCMCIA Type III
- SVHS out, 3 USB ports
- Integrated 10/100, V90 56K
- Windows XP Professional

$2495 N8T05104

- Intel Pentium 4 1.6GHz
- 14.1" XGA (1024 x 768)
- 256MB PC2100 DDR SDRAM
- 16Mb S3 Super Savage
- Internal DVD drive, 3.5" FDD
- 30GB Hard drive
- SD Slot, PCMCIA Type III
- SVHS out, 3 USB ports
- Integrated 10/100, V90 56K
- Windows XP Professional

$2945 N8T05103

Toshiba Satellite Pro 610



- Intel Pentium® 4 1.6GHz
- 15" XGA (1024 x 768)
- 256MB PC2100 DDR SDRAM
- 16Mb DDR GeForce4 420 Go
- Internal DVD/CDRW drive, 3.5" FDD
- 30GB Hard drive
- SD Slot, PCMCIA Type III
- SVHS out, 2 USB ports
- Integrated 10/100, V90 56K
- Windows XP Professional

$3799 N8T05[illegible]

Acer Travelmate 223X



- Intel Celeron® 1.13GHz
- 14.1" XGA (1024 x 768)
- 256MB PC2100 DDR SDRAM
- 8-32MB Intel 830MG Dynamic Video memory
- Internal CD drive, 3.5" FDD
- 20GB Hard drive
- PCMCIA Type III
- SVHS out, 2 USB ports
- Integrated 10/100, V90 56K
- Windows XP Professional

$2499 N8T05120

Acer Travelmate 270XV



- Intel Pentium® 4 1.4GHz
- 14.1" XGA (1024 x 768)
- 256MB DDR SDRAM
- 16Mb DDR SiS 650
- Internal CD drive, 3.5" FDD
- 20GB Hard drive
- PCMCIA Type III
- SVHS out, 3 USB ports, IEEE 1394
- Integrated 10/100, V90 56K
- Windows XP Professional

$3195 N8T05308

Acer Travelmate 634LC



- Intel Pentium® 4 1.6GHz
- 14.1" XGA (1024 x 768)
- 256MB DDR SDRAM
- 16Mb GeForce2® Go 100
- Internal DVD drive, Ext. 3.5" FDD
- 20GB Hard drive
- PCMCIA Type III, smartcard reader
- SVHS out, 2 USB ports, IEEE 1394
- Integrated 10/100, V90 56K
- Windows XP Professional

$5499 N8T05[illegible]

PDA - Pocket PC2002

Toshiba e310



- Intel Strongarm 206MHz Processor
- 32MB of RAM & 32MB Rom
- 125(H) mm x 79(W) mm x 12.4(D) mm
- 65,536 colour TFT
- In built Speaker & Stereo headphone socket
- SD Card Slot
- Infra Red port

$845 N8T05106

Toshiba e570



- Intel Strongarm 206MHz Processor
- 64MB of RAM & 32MB Rom
- 125(H) mm x 77(W) mm x 17.5(D) mm
- 65,536 colour TFT
- In built Speaker & Stereo headphone socket
- CFII and SD Card Slot
- Infra Red port

$990 N8T05107

Toshiba e740



- Intel PXA250 400MHz Xscale
- 64MB of RAM & 32MB Rom
- 125(H) mm x 80(W) mm x 16(D) mm
- 65,536 colour TFT
- In built Speaker & Stereo headphone socket
- CFII and SD Card Slot
- Infra Red port
- Integrated Bluetooth

$1499 N8T05[illegible]

Compact Ipaq 3970



- Intel PXA250 400MHz Xscale
- 64MB of RAM & 48MB Rom
- 320x320 pixel 65,536 colour TFT with backlight
- In built Speaker & Stereo headphone socket
- Internal Microphone & record button
- SD Card Slot
- Infra Red port

$1375 N8T05114

IPAQ Ipaq 3870



- Intel Strongarm 206MHz Processor
- 64MB of RAM & 32MB Rom
- 320x320 pixel 65,536 colour TFT with backlight
- In built Speaker & Stereo headphone socket
- Internal Microphone & record button
- SD Card Slot
- Infra Red port

$990 N8C0M342

Acer N25



- Intel PXA250 400MHz Xscale
- 64MB of RAM & 32MB Rom
- 129(H) mm x 79(W) mm x 12(D) mm
- 320x320 pixel 65,536 colour TFT with backlight
- In built Speaker & Stereo headphone socket
- Memory Stick Slot
- Infra Red port

$995 N8AC0E06

Sony Clie PEGSJ20G



- Dragonball VZ Processor 33MHz
- 16MB of RAM & 4MB Rom
- 104(H) mm x 71.8(W) mm x 16.5(D) mm
- 320x320 pixel 16 grey scale with backlight
- Memory Stick Slot
- Infra Red port
- Jog / Scroll

$525 N8T05102

Sony Clie 665



- Dragonball VZ Processor 66MHz
- 16MB of RAM & 4MB Rom
- 118(H) mm x 71.8(W) mm x 12.5(D) mm
- 320x320 pixel 65,536 colour TFT with backlight
- Memory Stick Slot
- Infra Red port
- Jog/Scroll dia

$915 N8T05[illegible]

Acer S65



- Dragonball VZ Processor 33MHz
- 16MB of RAM & 4MB Rom
- 122(H) mm x 78(W) mm x 13(D) mm
- 320x320 pixel 65,536 colour TFT with backlight
- Memory Stick Slot
- Infra Red port
- MP3 Audio

$745 N8AC0E15

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Pentium 4™ Socket 478 Processors

Pentium 4™ Processor 1.8Ghz 400Mhz FSB	$325 CPM1092
Pentium 4™ Processor 2Ghz 400Mhz FSB	$369 CPM1093
Pentium 4™ Processor 2.4Ghz 533Mhz FSB	$425 CPM1099
Pentium 4™ Processor 2.53Ghz 533Mhz FSB	$575 CPM1100
Pentium 4™ Processor 2.66Ghz 533Mhz FSB	$880 CPM1101
Pentium 4™ Processor 2.80Ghz 533Mhz FSB	$CALL CPM1102



Celeron™ Socket 478 Processors

1.7Ghz Celeron™ Processor	$159 CPM1096
1.8Ghz Celeron™ Processor	$199 CPM1098

AMD CPU

AMD Athlon™ MP Processors

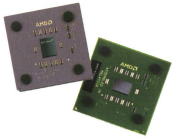
AMD Athlon™ MP 1800 + Processor	$325 CPM0063
AMD Athlon™ MP 1900 + Processor	$379 CPM0068
AMD Athlon™ MP 2000 + Processor	$425 CPM0071

AMD Athlon™ XP Processors

AMD Athlon™ XP 1800 + Processor	$189 CPM0060
AMD Athlon™ XP 1900 + Processor	$225 CPM0065
AMD Athlon™ XP 2000 + Processor	$235 CPM0067
AMD Athlon™ XP 2100 + Processor	$309 CPM0070
AMD Athlon™ XP 2200 + Processor	$355 CPM0073
AMD Athlon™ XP 2400 + Processor	$445 CPM0074
AMD Athlon™ XP 2600 + Processor	$CALL CPM0075

AMD Duron™ Processors

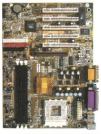
1.2Ghz Duron™ Processor	$119 CPM0066
1.3Ghz Duron™ Processor	$139 CPM0069



New Processors Coming SOON! Visit our website www.adelong.com.au, for the latest pricing information

Motherboard

AZZA PT-KT3



- Supports AMD Socket A Processors
- VIA Apollo KT266A Chipset
- 3 184 pin DDR-Ram Sockets
- Up to 3GB PC-1600/2100 DDR-Ram
- 1 x AGP, 5 x PCI, 1 CNR Slots
- 2 x UDMA 100/66/33 IDE Controllers
- 2 x USB Ports
- ATX Form Factor

$135 MBAZ2001

AZZA P4XA-AV



- Supports Intel Pentium 4 Skt 478 Processors
- VIA PX266A Chipset
- 3 184 pin DDR Sockets
- Up to 1.5GB 200/266/333Mhz DDR
- 1 x AGP, 6 x PCI Slots
- 2 x UDMA 100/66/33 IDE Controllers
- 2 x USB 2 Ports
- ATX Form Factor

$169 MBAZ2005

ECS P4VMM2



- Supports Intel Pentium 4 Skt 478 (upto 400Mhz FSB)
- VIA PM266 Pro Chipset
- 2 184 pin DDR Sockets (200/266DDR)
- 2 168 pin SDRAM Sockets (PC133/100)
- Integrated Savage 4 3D graphics Accelerator
- Integrated 10/100 Lan
- Integrated Audio (AC97)
- 1 x AGP, 2 x PCI
- 2 x UDMA 100/66 IDE Controllers
- ATX Form Factor

$139 MBECS002

Gigabyte GA-7VAXP



- Supports AMD SOcket A
- VIA KT400 + 8235
- 3 184 pin DDR Sockets (Max 3GB DDR400)
- 1 x AGP, 5 x PCI
- 2 x UDMA 100/66 IDE Controllers
- 2 x ATA-133 IDE RAID Controllers
- Integrated 5.1 Audio
- Integrated 10/100 Network
- 2 x USB 2.0 Ports, 1 x firewire Ports
- ATX Form Factor

$275 MBGIG075

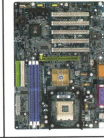
Gigabyte GA-8IE533



- Supports Intel Pentium 4 (FSB533/400)
- Intel 845E chipset
- 3 184 pin DDR Sockets (Max 3GB DDR200)
- 1 x AGP, 5 x PCI
- 2 x UDMA 100/66 IDE Controllers
- Integrated 5.1 channel Audio
- 2 x USB 2.0 Ports
- ATX Form Factor

$199 MBGIG069

Gigabyte GA-8SG667



- Supports Intel Pentium 4 (FSB533/400)
- SiS 648 Chipset
- 3 184 pin DDR Sockets (Max 3GB DDR266,2G DDR333)
- 1 x AGP, 5 x PCI
- 2 x UDMA 133/100/66 IDE Controllers
- Integrated 5.1 channel Audio with SPDIF
- 2 x USB 2.0 Ports
- ATX Form Factor

$195 MBGIG077

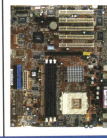
Gigabyte GA-7VKML



- Supports AMD SOcket A (FSB266)
- VIA Pro Savage + KM266
- 2 184 pin DDR Sockets (Max 1GB up to DDR266)
- 1 x AGP, 3 x PCI
- 2 x UDMA 133/100/66 IDE Controllers
- Integrated Audio(AC97)
- Integrated 10/100 Network
- 2 x USB Ports
- ATX Form Factor

$145 MBGIG071

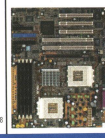
ASUS A7V333



- Supports AMD Socket A
- VIA KT333 Chipset
- 3 184 pin DDR Sockets
- Up to 3GB 200/266/333 Mhz DDR
- 1 x AGP Pro, 5 x PCI Slots
- 2 x UDMA 133/100/66/33 IDE Controllers
- 2 x USB & 2 x USB 2 Ports
- ATX Form Factor

$255 MBASU028

ASUS A7M266-D



- Supports Dual AMD Athlon MP
- AMD 760MPX Chipset
- 2 64/32-bit 66/33Mhz PCI Slots
- 4 x 184 Pin DDRSockets(Max 3.5GB Ram)
- 1 x AGP Pro/5 x PCI (2 x 64-bit, 3 x 32-bit)/1 x ACR
- 2 x UDMA 100/66/33 IDE Controllers
- ATX Form Factor

$595 MBASU025

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AMD SOHO Upgrade

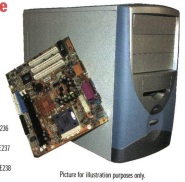
- ECS All In One Sdram/DDR
- Integrated Video
- Integrated AC-97 Audio
- Integrated 10/100 Ethernet
- Adelong Mini Atx case 250W

1.2Ghz Duron™ Processor	$299	SPADE233
1.3Ghz Duron™ Processor	$315	SPADE234
Athlon XP1800 +™ Processor	$355	SPADE235

Intel SOHO Upgrade

- ECS P4VMM2 All-in-one Sdram/DDR
- Integrated Video
- Integrated AC-97 Audio
- Integrated 10/100 Ethernet
- Adelong Mini Atx case 250W

1.7Ghz Celeron™ Processor	$319	SPADE236
1.8Ghz Celeron™ Processor	$345	SPADE237
P4-1.8Ghz Processor	$495	SPADE238



Picture for illustration purposes only.

Intel Gamer Upgrade

- Leadtek A250LE TH 128MB TI4200
- GA-7VAX or GA-8SG667
- Integrated AC-97 Audio
- Liteon 48x12x48 CDRW
- Adelong 9001 ATX case 300W

AMD Athlon™ XP 2000 +	$975	SPADE257
AMD Athlon™ Processor XP 2200 +	$1095	SPADE2
Intel Celeron™ Processor 1.8Ghz	$935	SPADE26
Intel P4-™ Processor 2.0Ghz	$1095	SPADE2
Intel P4-™ Processor 2.4Ghz	$1155	SPADE2

Hard Drives



Seagate

Barracuda

- Ultra ATA/100
- 8.9ms Seek Time
- 7200 RPM

40GB	$155	HDSGT057
60GB	$195	HDSGT067
80GB	$219	HDSGT068

Cheetah

- Ultra160 SCSI
- 68 Pin Interface
- 10000 RPM

18GB	$455	HDSGT090
36GB	$599	HDSGT061
73GB	$1195	HDSGT062

Maxtor

- ATA 100
- 5400 RPM

120GB	$325	HDMAX025
160GB	$515	HDMAX026

- ATA 133
- 7200 RPM

40GB	$159	HDMAX018
60GB	$209	HDMAX019
80GB	$229	HDMAX020

Notebook Hard Drives

- 9mm 2.5" Hard Drive
- ATA-100 IDE Interface
- 4200 RPM
- Compatible with most Notebooks

10GB	$199	HDHIT005
20GB	$245	HDHIT008
30GB	$295	HDHIT010
40GB	$365	HDHIT011

CD/DVD/CDRW

Adelong External Optical Drives

	FireWire		USB 2*	
24x10x40x	$259	MMADE001	$279	MMADE008
32x10x40x	$279	MMADE002	$299	MMADE009
40x12x48x	$299	MMADE003	$319	MMADE010
DVD-R/-RW	$969	MMADE007	$999	MMADE011

PC & Mac** Compatible

*USB 2 CD-RW Drives are backwards compatible with USB 1.1 ports, however, read/write speeds will be limited by USB 1.1 specifications.
**Mac Compatible refers to the external drive only. Macintosh compatible burning software is not included.

Pioneer DVR-A04 DVD-R/-RW

- DVD-R/-RW/CD-RW Combo Drive
- IDE Interface
- 2x1x6x DVD-R/-RW/8x4x24x CD-RW
- Compatible with most DVD Players

$799 MMPIO004



16 x DVD-Rom



$89 MMLIT003

- 16 x DVD-Rom/40 X CD-Rom Drive
- ATA-66 IDE Interface
- Includes DVD Playback Software

52 x CD-Rom $59 MMLIT000

Ben Q CDRW



- IDE Interface
- 32 x Write/12 x Re-Write/40 x Read
- Buffer Under-run Protection
- Include CR recording software

$119 MMBENQ006

LiteOn CDRW



- IDE Interface
- 40 x Write/12 x Re-Write/48 x Read
- 48X digital audio extraction.
- Buffer Under-run Protection
- Include CD recording software
- Burn a full CD in under 3 minutes

$125 MMLIT001

TDK VeloCD 40x12x48x



- IDE Interface
- 40 x Write/12 x Re-Write/48 x Read
- 48X digital audio extraction.
- Buffer Under-run Protection
- Include CD recording software
- Burn a full CD in under 3 minutes

$179 MMTDK000

LG DVD/CDRW Combo

- IDE Interface
- 16 x DVD Reader
- 32 x Write/10 x Re-Write/40 x Read
- Buffer Under-run Protection
- Include CD recording and DVD playback



$199 MMLGS2007

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512MB PC2100 DDR SDRAM **$275** RAGEN052
256MB PC2700 DDR SDRAM **$179** RAGEN063
512MB PC2700 DDR SDRAM **$295** RAGEN062
256MB PC3200 DDR SDRAM **$Call** RAGEN067
512MB PC3200 DDR SDRAM **$Call** RAGEN068



RAMBUS RAM

128mb 800MHZ Rambus RIMM **$Call** RAGEN034
256MB 800MHZ Rambus RIMM **$Call** RAGEN037

PC133 SDRAM

128MB PC133 SDRAM **$55** RAGEN030
256MB PC133 SDRAM **$99** RAGEN031
512MB PC133 SDRAM **$209** RAGEN047



Notebook SODIMM



128MB PC-133 SODIMM **$99** RAGEN054
256MB PC 133 SODIMM **$195** RAGEN033

128MB DDR SODIMM **$119** RAGEN065
256MB DDR SODIMM **$239** RAGEN066

Flash Memory

SmartMedia



64MB **$88** RAGEN069
128MB **$135** RAGEN070

MultiMedia



64MB **$99** RAGEN075
128MB **$175** RAGEN175

SecureDigital



64MB **$165** RAGEN074
128MB **$225** RAGEN071

Compact Flash Memory



64MB **$79** RAGEN056
128MB **$125** RAGEN058
256MB **$219** RAGEN060

Memory Stick



64MB **$99** RAGEN072
128MB **$175** RAGEN073

USB Flash



64MB **$99** RUGEN012
128MB **$145** RUGEN013
256MB **$245** RUGEN014

Video Cards

LeadTek A250 MyViVo



- nVIDIA GeForce 4 Ti Processor
- DVI & TV Out
- 64/128MB DDR RAM
- Dual Programmable Vertex Shaders
- MPEG 1/2 Analogue Video Capture
- Supports De-Interlaced Video
- Supports Picture In Picture Playback

$595 DCLEA025

LeadTek A170

WinFast A250 LE TD 64MB
$325 DCLEA023
WinFast A250 LE TD 128MB
$375 DCLEA026
WinFast A170
$175 DCLEA014



Matrox Parhelia



- 256-bit DDR Memory Interface
- Tripple VGA/Dual DVI/TV Out
- High Performance 2D, 3D & Video
- 20GB/s Memory Bandwith
- 512-bit GPU
- 128MB DDR Memory
- Surround Gaming
- 10-bit GigaColour

$1049 DCMAT062
Matrox Parhelia OEM **$959** DCMAT053

nVIDIA GeForce 4 MX 440



- nVIDIA GeForce 4 MX 440 Processor
- 64MB DDR RAM
- TV Out
- 6.4GB/Sec Memory Bandwith
- 34 Million Triangles per Second
- 1.1 Billion Texels per Second

$175 DCGEM029

nVIDIA GeForce 2 MX 400
64MB AGP **$99** DCGEN022

nVIDIA GeForce 2 MX 200
64MB AGP **$88** DCGEN024

Gigabyte R9700PRO



- Radeon 9700 GPU
- 256-bit DDR Memory Interface
- Tripple VGA/Dual DVI/TV Out
- New SMARTSHADER™ 2.0, MOOTHVISION™ 2.0and VIDEOSHADER™ technology
- 128MB DDR Memory
- First to fully support DirectX® 9.0 and the latest OpenGLR
- AGP 8x (2.0GB/sec)
- Bundle Software

$880 DCGIG004

Gigabyte AV65DG-E



- Radeon 9000 GPU
- 128-bit DDR Memory Interface
- VGA and TV Outputs
- 64MB DDR Memory
- DirectX® 8.1
- AGP 4x

Gigabyte AV65DG-H **$239** MMACE00X
$199 DCGIG003

Pinnacle PCTV Pro

- Real Time MPEG1-, MPEG2-, DV - software compression
- FM tuner with Real Time Audio Compression
- Time-shifting feature lets you pause or replay while recording a live show
- Pinnacle T -Rex multimedia file converter
- Pinnacle Studio 7 video editing software (TRIAL version)
- Infrared Remote Control (batteries included)
- Still image capture

$245 MMPIN011



Pinnacle PCTV $145 MMPIN010

Pinnacle Studio DV Plus

- Capture and edit DVD Quality MPEG video from DV or Digital8 camcorders
- Advanced preview window shows your edits immediately
- More than 100 scene transitions and Hollywood FX 3D transitions
- TitleDeko for title effects including drop-shadows and neon glows
- Intelligent Rendering renders only the effects.
- Custom audio features let you sync sound effects perfectly
- Import mp3 files or rip directly from CD for background music

$489 MMPIN002



Pinnacle Studio DV $345 MMPIN012

Lifeview Video 3000

- Watch TV on PC: 125-channel available, cable/air TV, analog TV tuner with Teletext.
- Demodulate stereo TV sound
- External input sources through AV or S-Video connector.
- Motion video capture saved as MPEG1 format up to 30 fps and single frame snapshot.
- Time-Shifting: The Time-Shifting feature provides instant replay.
- Tuner Modules support all TV standards.
- Wireless Remote Control
- FM Radio



$99 MMGEN041

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Panasonic

LF-311-PIN DVD RAM/R + CD/RW Kit

This Bundle comes complete with everything you need to:

- Make your own DVD movies on your PC
- Edit scenes, add effects, titles, sound and extra features
- Make CD or DVD slide shows from your digital stills.
- Backup up to 9.4GB of PC Data to Rewritable DVD-RAM
- Compatible with Win 98/2000/ME/XP
- LF-D311 DVD RAM/R (incl. Pinnacle Software and Firewire Card)

$859 MMPANO21

LF-D311 DVD RAM/R (incl. Pinnacle Software and Firewire Card)

$795 MMPANO16



U-KD0410-KIT

TX-LCD15S

- 15" Colour LCD
- 15" Viewable (Diagonal)
- Up To 1024 x 768
- 16.7 Million Colours
- 1-Touch AutoAdjust
- 5-Language OSD
- Stereo Speakers
- 340 degree Swivel Base

$845 MOPANO16



TX-LCD17S

- 17" Colour LCD
- 17" Viewable (Diagonal)
- Up To 1280 x 1024
- 16.7 Million Colours
- 1-Touch AutoAdjust
- 5-Language OSD
- Stereo Speakers
- 340 degree Swivel Base

$1499 MMPANO17

CW-8572 DVD/CDRW Combo



- 16x Write, 10x Re-Write, 48x CD read, 12x DVD Read
- DVD-RAM, DVD-R Compatible
- E-IDE (ATAPI 4) Interface
- Digital Audio Out Connection
- Horizontal or Vertical Mounting

$249 MMPANO20

Monitors

NEC LCD1550V

No Touch Auto Adjust adjusts the monitor to optimal settings upon initial power-on, low energy consumption reduces costs over the monitor's life.

- 15" Colour LCD
- 15" Viewable (Diagonal)
- Up To 1024 x 768
- 300:1 contrast ratio
- 16.7 Million Colours
- PC & Mac Compatible



$815 MOPH1009 black MOPH1010

NEC LCD1700V



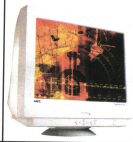
- 17" Colour LCD
- 17" Viewable (Diagonal)
- Up to 1280 x 1024
- 300:1 contrast ratio
- 16.7 Million Colours
- PC & Mac Compatible

$1395 MONEC012

Black **$1499** MONEC013

NEC FP1355 22"

he ultimate in screen performance with the 22" MultiSync FP1355 CRT. This monitor's flat screen virtually eliminates glare and distortion, while providing excellent sharpness and brightness.



- 22" Multisync CRT
- 20" Viewable (Diagonal)
- Up to 2048 x 1536 @ 75 Hz
- 16.7 Million Colours (s-RGB)
- PC & Mac Compatible
- 495(W) mm x 643(H) mm x 632(D) mm
- Weighs 29.7Kg

$1645 MOPH1014

Philips 107T

- 17" Colour CRT
- 12.8 x 9.6" Viewable
- 0.25mm Dot Pitch
- Up To 1280 x 1024 @ 64Hz
- 800 x 600 @ 86Hz
- 410(H) x 399(W) x 419(D)mm
- 15-pin Mini D-Sub Connector
- Weighs 16.5Kg



$325 MOPH1004

Philips 107E **$265** MOPH1015

Philips 109S

- 19" Colour CRT
- 14.4 x 10.8" Viewable
- 0.25mm Grille Pitch
- Up To 1920 x 1440 @ 60Hz
- 1280 x 1024 @ 85Hz
- 468(H) x 456(W) x 438(D)mm
- 15-pin Mini D-Sub Connector
- Weighs 23.5Kg



$495 MOPH1005

Phillips 201B40

- 21" Colour CRT
- 22" Viewable
- 0.25mm Grille Pitch
- Up To 1992 x 1440 @ 60Hz
- 1600 x 1200 @ 86Hz
- 501(H) x 801(W) x 466(D)mm
- 15-pin Mini D-Sub Connector
- 5 BNC Video Connectors
- Weighs 29Kg



$1299 MOPH1006

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Mitsubishi - Monitor / CD

Mitsubishi Diamond DPro 730



$519

MDMIT0328

- 17" Picture Tube
- 16" Viewable Diagonal Screen Size
- 0.25mm Phosphor Stripe Pitch
- Up To 1600 x 1200 @ 75Hz
- PC & Mac Compatible
- 413(H) x 399(W) x 415(D)mm
- Weighs 19Kg

Mitsubishi Diamond View 1998E



$495

MDMIT0329

- 19" Picture Tube
- 18" Viewable Diagonal Screen Size
- 0.25mm Dot Pitch
- Up To 1600 x 1200 @ 75Hz
- PC & Mac Compatible
- 455(H) x 476(W) x 463(D)mm
- Weighs 19Kg

Diamond View 1770H $295 MDMIT0326

Mitsubishi DP 2060u



$1999

MDMIT0330

- 22" DiamondTron NF Natural Flat Picture Tube
- 21" Viewable Diagonal Screen Size
- 0.27mm Aperture Grille Pitch
- Up To 2048 x 1536 @ 60Hz
- PC & Mac Compatible
- 493(H) x 495(W) x 473(D)mm
- Weighs 29.7Kg

Mitsubishi Diamond Data 40x12x48x



- IDE Interface
- 40 x Write/12 x Re-Write/ 48 x Read
- Buffer Under-run Protection
- Includes Nero Burning Rom

$125 MMMIT0321

Mitsubishi DV153 15" LCD

- 15" Colour LCD
- 15" Viewable (Diagonal)
- Up To 1024 x 768
- 16.7 Million Colours
- PC & Mac Compatible
- 380(W) mm x 383(H) mm x 166(D) mm
- Weighs 4.7Kg

Available In Beige Or Black

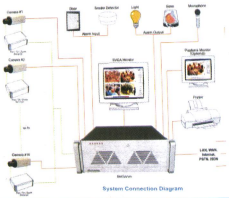


$845 MDMIT0331

Multi Vision

NetServer

NetServer is an all-in-one multi-channel digital video-recording device with built-in features using the latest Pentium CPU for high resolution real time monitoring and high quality real-time digital video recorded images.



System Connection Diagram

Please call Elite Technologies on (02) 98981966



Standard Configuration	NetServer 1000	NetServer 1500	NetServer 2000	NetServer 3000
Video Input	4 channel	8 channel	16 channel	16 channel
Audio recording	1 audio recording channel	1 audio recording channel	1 audio recording	5 audio channel
Alarm Feature	4 Alarm inputs 3 Alarm outputs	8 Alarm inputs 3 Alarm outputs	16 Alarm inputs 3 Alarm outputs	16 Alarm inputs 3 Alarm outputs
Digital video recording(Total)	25 fps	50 fps	100 fps	100 fps
Display modes	Full, Quad	Full, Quad 5/8-split	Full, Quad 7/10/13/16 -split	Full,Quad 7/10/13/16 -split
CPU	PIII 800 or above	PIII 800 or above	PIV or above	PIV or above
Hardware configuration	40 GB HDD, 3.5" FDD 128 RAM, 10/100M, CD-ROM	40 GB HDD, 3.5"FDD 128 RAM, 10/100M, CD-ROM	80 GB HDD, 3.5" FDD 128 RAM, 10/100M, CD-R/RW	80 GB HDD, 3.5" FDD 128 RAMBUS, 10/100M, CD-R/RW
Operating System	Windows 2000	Windows 2000	Windows 2000	Windows 2000
	$4576 SYEL0000	**$6765** SYEL0001	**$CALL** SYEL0002	**$CALL** SYEL0003

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Elite - DVR

U-Witness

The "u-Witness Pro" surveillance and security system is a powerful and low cost, user- friendly and PC-based system. It is designed for automatic remote video security and surveillance. The video transmission is via ordinary telephone line, LAN or Internet. No need to add extra card and or open your PC, just connect it to the USB port of your PC. The "u-Witness Pro" can be connected with up to 4 cameras, and also can be displayed/recorded at the same time on the PC.



Item / Model	CP-100U Pro*3	CP-400U Pro
Interface	USB	
Video Port	1 Channel	4 Channels
Audio Port	1 Channel	4 Channels(Selectable)
Video format	640(H)*480(V),352(H)*288(V), 320(H)*240(V),160(H)*120(V)	
Video system	NTSC or PAL	
Recording rate*1	30 FPS (@320*240)	25 FPS (320*240)
Image size*2	5-15K Byte (Wavelet) 2.5-12K Byte (M JPEG) 2.5-5K Byte (MPEG 4)	
Connector	1 audio and 1 video composite connector	4 mini DIN connector with Video/Audio and sensor input
Digital I/O port	No	4 Sensor input and 4 digital output
Emergency call	No	Yes
Video out	No	Scrolling 4 Video/Audio on TV (Option)
	$CALL	$CALL

Giga-Air 4010

The GigaAir 4010 offers a simple setup procedure, but gives full security functions to home or small office users. It consists of a color camera with a microphone and an integrated transmitter, and a 4-channel receiver. Using the latest in wireless technology, sound and vibrant full color images from the camera are sent up to 100m to a receiver, which could be connected to a TV for monitoring, or a to VCR for recording



$450 MMEL1001

$350 MMEL1002



Giga-air 3010 (same as 4010 except B&W camera)

Multi Vision Netcorder

NetCorder DIY is a PCI card that can fit into any conventional PC and can support up to 4 video inputs. It has self-installable software with digital video recorder (DVR) functions and it comes packaged with remote viewing software for the Internet. Just add cameras and it becomes a cost effective digital video surveillance and recording solutions for small offices or home offices.

- Support up to 4 cameras
- Pal and NTSC standards
- Windows 98SE/NT/ME/2000 compatible
- Full resolution real time display (786x576 PAL, 640x480 NTSC)
- Real time Mpeg 4/wavelet codex
- Simultaneous playback, recording and live display
- Programmable timer recording
- Alarm recording with scheduling
- Motion detection recording
- Pre-alarm recording
- One-channel audio recording



$750 MMEL1003

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Printers

Canon S100SP

- 720 x 360 dpi Print Resolution
- Up to 5 Pages Per Minute
- Banner & Poster Printing
- PC & Mac Compatible
- USB Interface



$109 PRCAN050

Canon 200SP

- 2880 x 1720 dpi Print Resolution
- Up to 5 Pages Per Minute
- Up to 3 Colour PPM
- PC & Mac Compatible
- USB Interface



$145 PRCAN049

Canon S300

- 2400 x 1200 dpi Print Resolution
- Up to 11 Pages Per Minute
- Up to 7.5 Colour PPM
- PC & Mac Compatible
- USB Interface



$189 PRCAN049

Canon S520

- Up to 14 Black & White/9 Colour Pages Per Minute
- Colourfast for up to 25 Years*
- 2400 x 1200 dpi Print Resolution
- Full-Bleed Printing Up To A4
- USB & Parallel Interfaces
- PC & Mac Compatible
- Individual Ink tanks



$355 PRCAN050 *When Using Canon's Photo Paper Pro

Canon 750

- Up to 20 Black & White/13 Colour Pages Per Minute
- Colourfast for up to 25 Years*
- 2400 x 1200 dpi Print Resolution
- Full-Bleed Printing Up To A4
- USB & Parallel Interfaces
- PC & Mac Compatible
- Individual Ink tanks



$425 PRCAN052

Canon S820D

- Up to 4 Black & White/4 Colour Pages Per Minute
- Colourfast for up to 25 Years*
- 2400 x 1200 dpi Print Resolution
- Borderless Printing Up To A4
- Bubble Jet Direct Memory Card Printing
- USB & Parallel Interfaces
- PC & Mac Compatible
- Individual Ink tanks



$775 PRCAN054

Epson Stylus Photo 925

- Up to 8.5 Black & White/8.5 Colour Pages Per Minute
- Colourfast for up to 25 Years*
- 5760 x 720 dpi Print Resolution
- Borderless Printing Up To A4
- Memory Card Printing
- USB
- PC & Mac Compatible
- 6 Individual Ink tanks



$545 PREPS053

Epson Stylus Photo 1290

- Up to 9.4 Black & White/9 Colour Pages Per Minute
- Colourfast for up to 25 Years*
- 2880 x 720 dpi Print Resolution
- Borderless Printing Up To A3
- USB & Parallel Interfaces
- PC & Mac Compatible
- 6 Individual Ink tanks



$989 PREPS054

Epson

Stylus C41UX	**$115** PREPS044	Stylus Color 1160	**$579** PREPS051
Stylus C41SX	**$169** PREPS048	Stylus Photo 870	**$359** PREPS041
Stylus C61	**$219** PREPS049	Stylus Photo 890	**$549** PREPS052
Stylus C70	**$415** PREPS050	Stylus Photo 895	**$535** PREPS053
Stylus C80	**$519** PREPS047	Stylus Photo 1290	**$989** PREPS053

HP LaserJet 1200

The personal desktop laser all-in-one that is ideal for the home office, small business

- Up to 15ppm Black & White
- 1200 dpi Print Resolution
- USB & Parallel Interfaces
- PC & Mac Compatible



$779 PRHP0092

HP LaserJet 2200

A reliable office laser printer, the HP LaserJet 2200 series is essential for business professionals who are looking for professional laser print quality with good productivity and versatility at an affordable price.

- Up to 18ppm Black & White
- 1200 dpi Print Resolution
- Parallel Port, LocalTalk
- Optional Network interface
- PC & Mac Compatible



$1469 PRHP0118

HP

Deskjet 656c	**$89** PRHP0110	Deskjet 5550	**$279** PRHP0115
Deskjet 845c	**$139** PRHP0109	Deskjet 990cxi	**$579** PRHP0116
Deskjet 3420	**$145** PRHP0112	LaserJet 1000	**$589** PRHP0117
Deskjet 3820	**$195** PRHP0113	LaserJet 1200	**$779** PRHP0092
Deskjet 960c	**$229** PRHP0114	LaserJet 2200	**$1469** PRHP0118
Deskjet 948c	**$269** PRHP0111		

Scanners

Epson 1260

The combination of powerful features, ease-of-use, high quality and affordability with the Perfection 1260 Photo has taken home scanning to new levels.
High speed document and photo scanning

- Transparency Unit for 35mm film negatives/slides
- Up to 1200 dpi (2400 dpi sub-scan)
- Single button operation and full auto mode
- Bundled with photo editing OCR



$220 IOEPS011

Epson 2400

High speed and high resolution film scanning performance for the demanding user, the EPSON Perfection 2400 Photo delivers exceptional performance for every scanning need.

- Integrated Transparency Unit for 35mm slides and films
- High resolution – 2400 dpi (4800 dpi sub-scan)
- Bundled with Adobe Photoshop Elements, OCR
- On-board high-speed ASIC processor
- USB 2.0 High speed interface



$479 IOEPS012

Canon D646Uex

This stylish and compact unit is easy to set up with a Mac or PC to produce outstanding 600 x 1200 dpi resolution images.

- Powerful Imaging and OCR software • 600 x 1200 dpi
- 48-bit input and 24-bit output
- Connect to Mac or PC
- Advanced Z-Lid
- USB Interface

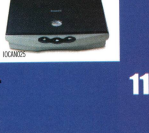


$165 IOCAN027

CanoScan 1250U2

Designed for ease of use and quality scanning, the CanoScan D1250U2 has three built-in scan buttons, for easy operation with tasks such as scan, copy and email.

- 1200 x 2400 dpi Optical Resolution
- 48-bit input and 24-bit output
- Advanced Z-Lid for scanning of bulky items
- Fast USB 2.0 Interface



$229 IOCAN025

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Adelong Computers

Digital Cameras

Canon Powershot S200

The PowerShot A200 is the perfect entry level digital still camera, merging many of the same capabilities and features as high-end digital cameras with the benefits of economy and ease of use. Combining a high resolution 2.0 Megapixel CCD, f2.8 fixed Canon lens, auto focus and photo effect modes in a sleek, pocketsize body

- 2.0 Megapixel digital camera
- Canon fixed-focal length, auto focus, 5mm f2.8 lens.
- Easy image transfer, photo printing, PC/TV display.
- movie recording/playback @320 x 240 pixels,15 fps
- 8Mb Compact Flash Card
- Use of widely available and cost-effective AA batteries.



$369 CSAN0029

Canon Digital Ixus V2

The PowerShot Digital IXUS V2 delivers high quality, sharp photos with every shot no matter what the setting. This sleek addition to the Canon PowerShot family combines a stylish, brush-finish stainless steel body with a 2.0 MegaPixel CCD, Canon 2 x optical zoom lens, advanced 5-point AiAF focusing and evaluative exposure control.

- Sleek, smart and stylish brush-finish stainless steel body weighing a tiny 180g.
- 2.0 MegaPixel CCD records 1600 x 1200 pixels in large file mode.
- movie recording/playback @640 x 320 pixels,15 fps
- 2 x optical zoom, 5 x digital zoom.
- 8Mb Compact Flash Card
- Li-Ion battery and battery charger
- Software for Mac and PC



$779 PRCAN030

Canon Powershot S40

The PowerShot S40 boasting a massive 4 million pixel resolution. A whole host of impressive technical features open up sea of creative possibilities.

- High resolution Canon 3x f/2.8-4.9 aspherical zoom lens
- 4 Megapixel CCD image sensor produces
- 2272 x 1704 pixel resolution for outstanding photos
- movie recording/playback @320 x 240 pixels,15 fps
- Evaluative, centre-weighted and spot metering
- Selectable 3-point AF or Manual Focus
- Exposure modes (P, TV, AV, Manual)
- 16Mb Compact Flash Card
- Li-Ion battery and battery charger
- Software for Mac and PC

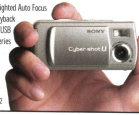
$1379 PRCAN031



Sony CyberShot U10

It's not until you've held Sony's Cyber-shot U in the palm of your hand that you realise just how small it is: weighing in at a mere 87 grams.

- 1.2 Effective Mega Pixel Super HAD CCD
- Focal Length 35mm
- Multi Point and Centre Weighted Auto Focus
- MPEG Movie recording/playback
- Connection to your PC via USB
- 2 x AAA rechargeable batteries
- Battery charger
- 8MB Memory Stick
- Neck Strap



$489 PRSON012

Sony DSC-P51

The perfect balance between performance, price and features. The Cybershot P51 is Ideal for the first time digital camera user.

- 2.1 Effective Mega Pixel Super HAD CCD
- Focal Length 41 - 82mm
- Evaluative, spot metering
- MPEG Movie recording/playback
- Connection to your PC via USB
- Li-Ion battery/battery charger
- 16MB Memory Stick
- Neck Strap



$625 PRSON013 **P71 $945** PRSON014

Sony Cybershot P9

With the DSC-P9, there is no compromise between its tiny size and great picture quality. With 4.0 megapixel Super HAD CCD means even with the fun you'll have with this compact sexy camera you'll still be able to produce high quality images

- 4.0 Effective Mega Pixel Super HAD CCD
- Focal Length 39 - 117mm
- Evaluative, spot metering
- MPEG Movie recording/playback
- Connection to your PC via USB
- Li-Ion battery/battery charger
- 16MB Memory Stick



$1495 PRSON015

BenQ 1300

- 1.3 Megapixel
- Inbuilt 16MB Memory
- Built In Flash
- 87 x 57 x 26mm
- Weighs 63g (Excluding Battery)



$235 KAIE3011

Casio Exilim M1

Advanced CASIO technology brings you digital imaging at its thinnest! A bright, clear TFT LCD monitor screen, plus powerful image recording features and functions in a trim packages that measures 11.3 millimeters thin and weighs a mere 85 grams.

- 1.3 Mega Pixel CCD (1600x1200)
- Focal Length 35mm
- 4x Digital Zoom
- LCD Remote control headphones
- MPEG Movie recording/playback
- Mp3 playback and voice recording
- Connection to your PC via USB
- Li-Ion battery/battery charger
- 12Mb Built in Memory + SD/MMC Slot



$789 MMCASIO00

Samsung Digimax Mp3

- Tripple Mode - USB WebCam - Digital Still Camera - MP3 Player
- 640 x 480 Digital Still Image Resolution
- Maximum WebCam Resolution 320 x 240 dpi

- 32MB Compact Flash Card
- Headphones
- USB Cable
- Stand
- Carry Case

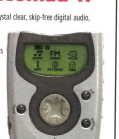


$219 IDSAM001

Mp3 Players

Creative Nomad II

Compact, shock-proof and designed for crystal clear, skip-free digital audio, NOMAD II is a perfect complement to your active lifestyle. With a 64MB Smart Media™ flash memory card, NOMAD II lets you enjoy 2 hours of skip-free CD-quality MP3 music or 4 hours of voice recording. You can even customize your music by swapping memory cards with different audio content or between your NOMAD II and another compatible device.



$385 MMCRE061

Creative Nomad Muvo

If you are looking for a great sounding tiny MP3 player with superior flexibility to store any files quickly and easily then the NOMAD® Muvo™ is right for you! With its unique 2-piece design, this tiny hybrid player offers fantastic sound quality as an MP3 player and unparalleled versatility as a USB data storage device. The NOMAD® Muvo™ is so eloquently compact it can fit virtually anywhere. Imagine storing an hour of digital music or over 44 floppies worth of data on your key chain!



64M $295 PRCER100
128M $389 PRCER099

Creative Jukebox

The original, hand-held NOMAD® Jukebox MP3 player lets you enjoy your music, your way. Listen to, store, and carry around your MP3 music in style. The NOMAD Jukebox with 6GB capacity can store up to 100 hours of CD-quality MP3 music. That's like having a 150 + CD changer in the palm of your hand! With its supreme versatility, extensive USB connectivity, and empowering accessory line, the NOMAD Jukebox sets a new standard for portable MP3 players.



$495 MMCRE063

Please see page 6 for memory cards

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Sound Cards

Games Surround Fortissimo III

Hercules is thrilled to announce the launch of Gamesurround Fortissimo™ III 7.1, the first offering in its revolutionary new 7.1 channel sound card range.



- Cirrus Logic SoundFusion CS4624
- Sensaura 3D Engine
- 20-bit quad output
- 18-bit dual stereo input codec
- Dolby Digital™ & Dolby Digital™ EX™
- Front/Rear/Center/LFE output
- Digital S/PDIF (optical)

$99 MMCGU002

Game Surround Muse 5.1 DVD



- Cirrus Logic Crystal 4630 Soundfusion Audio Processor
- Full-Duplex Hardware Record & Playback @ up to 48 kHz
- 8MB DLS Synthesizer
- 64 Voice Hardware Wavetable Engine
- 18-bit Recording/20-bit

$79 MMCGU012

Videologic Sonic Fury



- Cirrus Logic Crystal 4630 SoundFusion Audio Processor
- Full-Duplex Hardware Record & Playback @ up to 48 kHz
- 8MB DLS Synthesizer
- 64 Voice Hardware Wavetable Engine
- 18-bit Recording/20-bit Playback
- 5.1 Channel Audio Output
- 5 Year Warranty

$225 MMTU8007

Creative Audigy 2 Platinum



Sound Blaster Audigy 2 delivers high-quality multi-channel recording and playback at up to 24-bit/96kHz and is the first PC product to offer playback of Advanced Resolution DVD-Audio at an astonishing 24-bit/192kHz with a stunning Signal-to-Noise ratio of 106dB

- SOUND BLASTER 24-BIT ADVANCED HD AUDIO
- THX®-CERTIFIED
- 6.1 SURROUND SOUND
- 24-BIT/ 96 kHz RECORDING
- EAX® ADVANCED HD™ GAMING

$CALL MMCBE086

Creative Audigy DE	**$179** MMCBE076
Creative Audigy Platinum	**$389** MMCBE077
Creative Audigy Platinum Ex	**$475** MMCBE078
Creative Sound blaster Live DE 5	**$79** MMCBE072

Creative Extegy

THE SIMPLE, PLUG-IN AUDIO ENHANCEMENT FOR THE DESKTOP AND NOTEBOOK PC
Sound Blaster® Extigy™ is the revolutionary external quality audio solution from Creative®. Designed to provide stunning digital audio to notebook or desktop users who cannot open their PCs or would prefer not to.



- Connect to any PC with USB
- A remote control is standard.
- 24-bit DACs and a 100dB signal-to-noise ratio

$349 MMCBE082

Speakers

Altec Langsing AVS500

The compact AVS500B is a solid entry-level surround system that will instantly improve the way your PC sounds.



- 4.1 Channel Speakers
- 6.1W RMS Subwoofer/2.2W RMS per Satelite
- 17W RMS Total Power Output
- 40Hz - 22kHz Frequency Response
- Built in controls

$139 MMAL7013

Altec Lansing AVS 300 (2speaker + Sub) **$79** MMAL7015

AVS 2100/5100

Whether you're watching movies, playing games or listening to music on your PC, you demand big sound. Two- and three-speaker systems just don't cut it. The Altec Lansing 5100 was designed for audio fanatics like you.



- 5.1 Channel Speakers
- 22.5W RMS Subwoofer/7W RMS per Satelite
- 73W RMS Total Power Output
- 22Hz - 22kHz Frequency Response
- Full-Function Digital Controller
- Headphone Jack, Auxiliary Input Jack

$CALL MMAL7021

Altec Lansing 2100 (2speaker + Sub) **$245** MMAL7017

Altec Langsing 641

Our Ultimate 5-piece system immerses you in breathtakingly powerful sound. A dual-ported subwoofer delivers deep, sustaining bass that brings your favorite games to life. If you're serious about gaming, this system will blow you away.



- 5.1 Channel Speakers
- Magnetic shielding
- Satelite mounted audio controls
- 29W RMS Total Power Output
- 70Hz - 18kHz Frequency Response

$475 MMAL7020

Altec Lansing 621 (2speaker + Sub) **$215**

Creative Travel Sound

Compact, lightweight and foldable, Creative® TravelSound™ speakers are so convenient to bring along on your travels. It features slim Titanium Micro Drivers for enhanced audio. Couple that with the digital amplifier that gives you power without zapping your battery life.



- 320g/11.29oz (with batteries)
- 154mm(L) x 65mm(W) x 50mm(H)
- Includes a universal power adaptor
- a handy carrying case
- a USB cable and
- a 3.5mm stereo-to-stereo cable

$CALL MMCBE098

Creative Inspire 5300

Creative Inspire™ 5.1 5300 adds Dolby® 5.1 home-theater quality audio to your movies, music and games.



- 18W RMS Subwoofer/6W RMS per Satelite
- Compact Satelites/High Performance Drivers
- 5.1 Channel Speakers
- Magnetic shielding
- Wired volume control with power switch
- 47Hz - 20kHz Frequency Response

$275 MMCBE084

Creative Inspire 5700

Experience the full power of Dolby® Digital 5.1 and DTS® technologies right in your home with the Creative Inspire™ 5.1 Digital 5700. The decoder amplifier provides the most comprehensive connectivity to your set-top DVD player, console station or your PC.



- 30W RMS Subwoofer/7W RMS per Satelite
- Compact Satelites/High Performance Drivers
- Magnetic shielding
- Remote control with power switch
- 35Hz - 20kHz Frequency Response

$699 MMCBE139

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Adelong Computers

Skymaster - Storage

Skymaster External Hard Drive

- Integrated power supply
- Includes Power Cable
- Includes FireWire/USB 2 Cable
- Compatible with Windows 98/ME/2000/XP
- Compatible with Mac OS 8.6/9.x/10.x
- (W) 162 x (L)208 x (H)36 mm
- Weight 1.5Kg Including Cables



PC & Mac Compatible

	FireWire 24MB/s	USB 2* 15.9MB/s
40GB	$299 HDADE000	$299 HDADE006
60GB	$335 HDADE001	$335 HDADE007
80GB	$355 HDADE002	$355 HDADE008
120GB	$455 HDADE009	$455 HDADE011
160GB	$679 HDADE010	$679 HDADE012

*USB 2 Hard Drives are backwards compatible with USB 1.1 ports, however, transfer rates will be limited to USB 1.1 specifications.

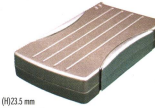
Skymaster Pocket Hard Drive

PC & Mac Compatible

FireWire/USB 2 Combo

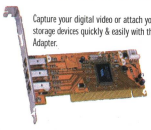
10GB	$299 HDADE013
20GB	$355 HDADE014
30GB	$445 HDADE015
40GB	$495 HDADE016

- Weighs 500g
- (W)79 x (L)143 x (H)23.5 mm
- FireWire & USB 2 Cables Included
- Compatible with Windows 98/ME/2000/XP
- Compatible with Mac OS 8.6/9.x/10.x



PCI to Firewire

Capture your digital video or attach your high speed storage devices quickly & easily with the PCI to FireWire Adapter.



$79 CCGEN039

PCI to USB2

Connect all your USB 2.0 devices to this easy to install adapter. 100% backward compatible with all USB devices.



$55 CCGEN043

PCI to USB $35 CCGEN040

PCI to USB2/Firewire



Connect all of your USB, USB 2 & FireWire peripherals to a single card.

$199 CCGEN041

PCMCIA Firewire

Capture your digital video or attach your high speed storage devices quickly & easily with the PCMCIA FireWire Adapter.



$125 CCGEN040

USB 2 Card Reader

- USB 2.0 AND 1.1 compatible
- Reads IBM MicroDrive & Compact Flash Cards
- Driverless Support Under Windows 2000/ME/XP
- PC & Mac Compatible
- Compact Design With No Cables Required



$79 MMGEN032

USB Card Reader $45 MMGEN038

Ext USB Floppy

- Compact & portable design
- Plug & Play, Hot swappable
- No external power required (Bus powered mode)
- USB interface
- Supports both PC & MAC



$99 FDGEN000

Skymaster - Network

10/100 PCI Network Card



- Single RJ-45 connector
- Auto detection of network speed
- Plug-n-Play independent of the CPU speed.
- Support half and full duplex operation.
- Low Ethernet Command Processing Overhead.
- 32-bit Memory addressing
- Multi-thread operation.

$25 NWGEN021

USB to 10/100 Network Adapter

Conveniently add a network card quickly & easily

Compatible with:
Windows 98
Windows Millennium Edition
Windows 2000 Professional



$95 USADE043

PCMCIA Network Adapter

Connect your notebook computer to a 10BaseT or 100BaseTX network in just minutes. The 10/100 PC (PCMCIA) Card will allow you to share files, printers, Internet connections and more.

- Low Power Consumption
- share files, printers, Internet connections



$88 NWGEN018

Internet Gateway



- Share DSL, Cable or Dial Up
- Built-in Firewall & Print Server
- Built-in 4 Port 10/100 Hub
- Simple 10 Minute Set Up
- Compatible with: Windows 9x/ME/XP/2000 Mac OS 8.x & Above Linux/Unix Distributions

$220 NWACC000

10/100 Network Switch

Auto-negotiation on all ports to match the speed of the attached devices
NWay switch ports support full and half duplex, 10Mbps and 100Mbps connections
Automatic polarity correction
Small foot-print
Non-blocking performance
Plug-n-play installation



5 Port $59 NWGEN030
8 Port $79 NWGEN027
16 Port $199 NWGEN02

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Fax: 02 9267 5042 sales@adelong.com.au

Networking

Dlink DFE-538TX



DFE-538TX Fast Ethernet adapter is a high-performance auto-sensing 10/100Mbps dual-speed adapter for the PCI bus with Wake-On-LAN (WOL) feature - a power management function that supports sleep mode and power-on control from remote location.

$35 NWDL0367

PCMCIA 690TXD Cardbus, direct port

The DFE-690TXD is a 32-bit Cardbus 10/100Mbps NWay Fast Ethernet PC Card with a built in connector, allowing direct plug-in for a RJ-45 LAN cable to a laptop and notebook computers.



$115 NWDL0047

Dlink IP Router 704P



The D-Link DI-704P is an Ethernet Broadband Gateway with a built-in four-port switch plus a print server function. The DI-704P is equipped with four 10/100Mbps Fast Ethernet ports and a bi-directional LPT port to support a direct printer connection.

The DI-704P's integrated Router and Firewall provide NAT, DHCP, and packet filtering services between the local network and the Internet. Built In Client for telstra cable.

$235 NWDL1076



Seven Port version of the 704P

DI 707P $299 NWDL1078

Dlink DSL-504



The D-Link DSL-504 DSL Router with 4-Port Switch is the easiest way to share your high-speed DSL Internet connection. With 10MB of integrated SDRAM for routing tables and MAC address translation, the DSL-504 provides all of the benefits of a high-end business router. At the heart of the DSL-504 is a built in ADSL modem that provides blazing fast Internet access over a regular phone line.

DSL-200 USB DSL Modem $195 NWDL1006

DSL-300 Ethernet DSL Modem $315 NWDL1007

DSL-500 Router/DSL modem $375 NWDL1008

Airplus DWL-520+

The DWL-520 + is a powerful 32-bit PCI adapter that installs quickly and easily into desktop PCs When the DWL-520 + is connected to standard 802.11b devices, transfer rates can be up to 20% faster. When connected to other D-Link AirPlus products, the performance is even greater — up to 22Mbps!



$199 NWDL0350

Airplus DWL-650+

The DWL-650 + is a powerful 32-bit CardBus Adapter that installs quickly and easily into laptop PCs and when used with other D-Link AirPlus products automatically connects to the network.



$145 NWDL0352

Dlink DI-614+

The DI-614 + is ideal for those creating their first wireless network, as well as for more advanced users looking for additional management settings and policy-based content filtering. An integrated 4-port switch allows direct connection of up to four computers. Several wireless clients can also securely connect to the network using 64, 128, or 256-bit encryption.



$455 NWDL1079

Dlink DWL-900AP+

The D-Link AirPlus DWL-900AP + is an enhanced 802.11b Wireless Access Point. The DWL-900AP + is fully compatible with the IEEE 802.11b standard making it interoperable with all existing IEEE 802.11b compliant devices. The DWL-900AP + also features 256-bit WEP encryption for a higher level of security for your data and wireless communications.



$299 NWDL1080

Airpro DWL-A520

At 54 Mega bits per second (Mbps), the D-LinkAir Pro 5GHz DWL-A520 highspeed wireless PCI adapter delivers unsurpassed wireless performance. With IEEE 802.11a standard compliance, the D-LinkAir Pro DWL-A520 highspeed wireless adapter is designed for indoor use and provides excellent network scalability.



$489 NWDL1081

Airpro DWL-A650

The DWL-A650 has a type II PCMCIA interface to provide a slim line design and maximize efficiency. At 54 Megabits per second (Mbps), the D-LinkAir Pro DWL-A650 5GHz highspeed wireless CardBus adapter delivers the fastest standards-based wireless technology in the industry. With IEEE 802.11a standard compliance, the D-LinkAir Pro DWL-A650 high-speed wireless adapter provides excellent network interoperability.



$445 NWDL1082

Dlink DWL-5000AP

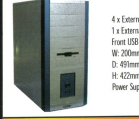
The D-Link AirPro DWL-5000AP connects computers equipped with 802.11a wireless adapters in a wireless local area network. A typical installation in the home involves connecting the DWL-5000AP to a Residential Gateway to share a broadband connection - Cable or DSL - to computers with installed 802.11a wireless adapters. The D-Link AirPro DWL-5000AP has a 10/100Mbps port to allow connection to an existing "wired" network.



$995 NWDL1083

Cases

ADELONG M71 ATX



4 x External 5.25" Bays
1 x External 2.5" Bays
Front USB
W: 200mm
D: 491mm
H: 422mm
Power Supply: 300W ATX

$79 CAADE092

ADELONG 9001 ATX



4 x External 5.25" Bays
2 x External 2.5" Bays
Front USB & Audio In/Out
W: 200mm
D: 491mm
H: 422mm
Power Supply: 300W ATX
Black also available

$79 CAADE094

ADELONG 3004 ATX



3 x External 5.25" Bays
2 x External 2.5" Bays
W: 195mm
D: 445mm
H: 430mm
Power Supply:
250W ATX

$55 CAADE096

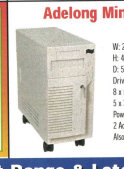
Cool Master Case



W: 21cm
H: 54.5 cm
D: 46 cm
Drive Bays: 4 x 5.1/4", 6 x 3.5"
(include 2 external)
Power Supply: no power supply
Case Fan: 2 front fan holder 1 back fan holder,
hdd fan holder built in (for 3 hdd only)
Door: front door with lock for cover 4 x
5.1/4", 2x3.5" drive and power switch.
Weight: 13kgs

$265 CAADD000

Adelong Mini Server Case



W: 224mm
H: 436mm
D: 500mm
Drive Bays:
8 x 5.25" (1 Internal)
5 x 3.5" (4 Internal)
Power Supply: 400 Watt ATX
2 Additional cooling fans
Also available in charcoal

$159 CAADE035

Power Supplies

AT Power Connectors



ATX Power Connector



200W AT POWER SUPPLY $39 PSGEN000
300W P4 ATX POWER SUPPLY $55 PSGEN003
350W P4 ATX POWER SUPPLY $59 PSGEN011
400W P4 ATX POWER SUPPLY $89 PSGEN015
520W P4 ATX POWER SUPPLY $175 PSGEN017



+ 550Watt 3 fan

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Miscellaneous

USB HUBS

4 Port USB 1.1 Hub



$55 USAE0063

7 Port USB 1.1 Hub



$75 USAE0062



USB to Printer Cable Compatible with Windows 95/98/2000

$55 CBGEN160



USB Serial Adapter Windows & Mac Compatible

$65 USAE0342



USB to PS2 Adapter Windows & Mac Compatible

$55 CBGEN212

CoolerMaster CPU Cooler



Suitable for Socket A & Socket 370 processors to 1.8Ghz

$29 MSAE0141

JustCooler CPU Cooler

Ultra-Quiet CPU fan suitable for Socket A & socket 370 processors up to 2Ghz



$35 MSAE0342

JustCooler FC-900L

JustCooler FC-900L Central System Cooler. Extracts heat from the centre of your PC



$35 MSGEN015

JustCooler HD-600



JustCooler HD-600 Hard Driv Cooler. Keeps your hard drive cool & dust free

$25 MSUS000



80mm Case Fan. Adds additional cooling to your PC

$9 MSADE010

I/O Expansion Cards



PCI Printer Card

$39 CCGEN032



Dual PCI Printer Card

$45 CCGEN037

PCI One High Speed Serial Port Card

$49 CCGEN036

PCI Two High Speed Serial Port Card

$55 CCGEN029

TEKRAM DC-315U Ultra SCSI Card



$49 CCGEN019

3.5" Floppy Drive



$29 FDPAN000

56K V.90 MODEM



Internal PCI $35 FMGEN002

External Serial $89 FMGEN003

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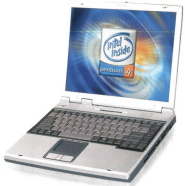
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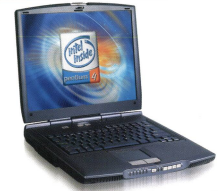


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- Logitech Internet K/B & Optical Mouse
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